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Improved Portable Stump Extractor.

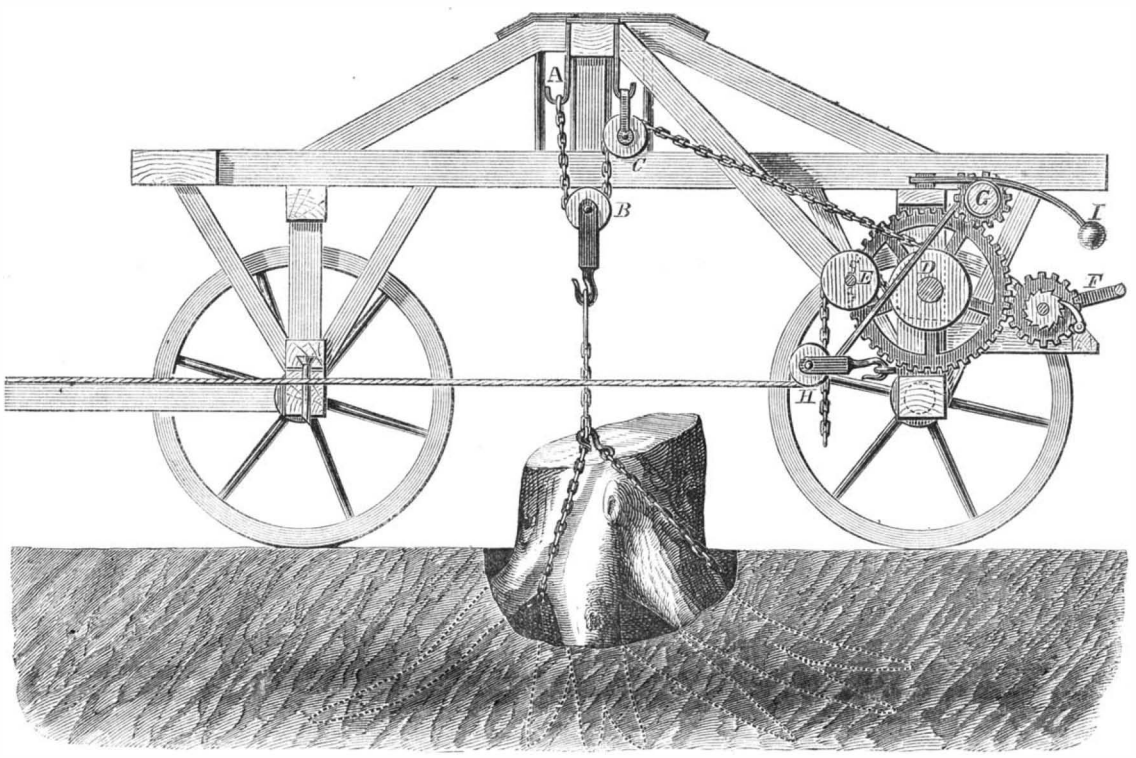
The engraving presents a longitudinal vertical section of a stump extractor, which being mounted on wheels, may be readily moved from place to place, and yet which remains firmly fixed in place, without blocking, while in use. The lower portion of the frame is V-shaped; the open ends of the V at the rear. This portion is supported on braced uprights, forming bolsters that rest on the two axles. Rising above this bed is a very strong, thoroughly braced superstructure, which receives the immediate strain of the lifting chain. This chain is attached at one end to a hook, A, and descending receives in its bight the hook sheave, B, from whence it passes over the fixed sheave, C, to an iron drum, D, the surface of which is formed with depressions to receive the links of the chain. This form of construction of the drum, with the fact that the chain passes around about two thirds of its circumference, proves sufficient to hold the chain without slipping under the heaviest strain, and permits it to pass freely to the ground over the pulley, E.

In operation, if the stump is not too large, or too firmly held, the drum may be rotated by means of one or two cranks, F, which give motion to a pinion the teeth of which mesh with those of the large gear on the drum, D. To hold the strain thus obtained the pinion shaft carries a ratchet with the teeth of which a pawl engages.

When, however, some power greater than manual is required, a rope is led from the circumference of the small drum, G, under a pulley, H, to the yoke or whiffletree of a pair of oxen or horses. A handle, I, with clutch attached, serves to throw the pinion and drum, G, in or out of gear. The power exerted by either of these methods is immense; the most obdurate stump, however firmly held in the soil, must yield to it. The machine is applicable also to lifting and conveying heavy stones and other weighty bodies.

Patented through the Scientific American Patent agency, by C. C. Manuel, North Troy, Vt.

For particulars concerning the patent address O. N. Elkins, North Troy, Vt.



MANUEL'S PATENT STUMP PULLING MACHINE.

The Chicago River Tunnel.

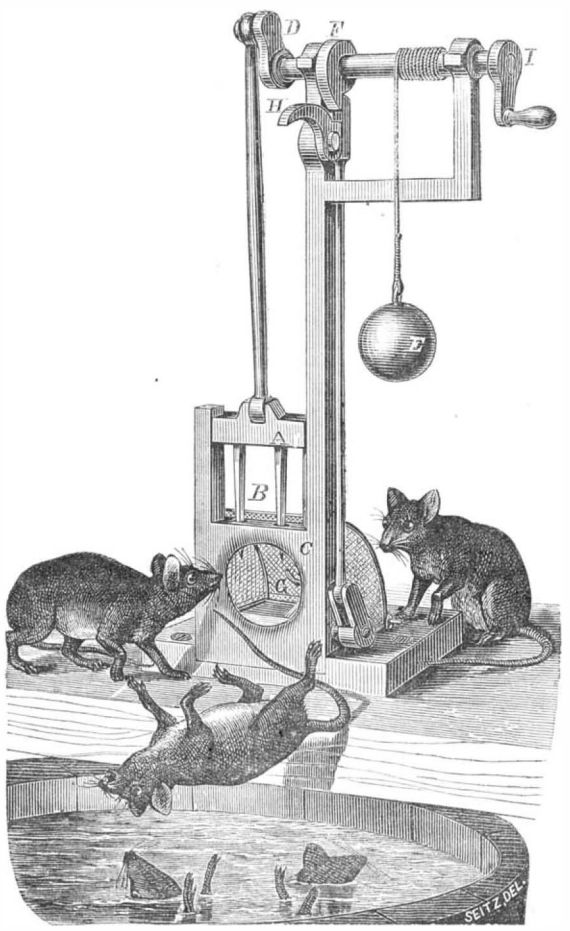
Work on this tunnel is rapidly progressing, and there is little doubt that this great thoroughfare may be opened in the early spring. The obstructions are to be removed from the river by December 1. From 300 to 400 men are employed on the work, and the whole is pushed forward to completion as rapidly as possible. Six hundred and sixty-five feet of the arching are already finished, leaving 265 feet still to be built. The east excavation is now 80 feet inside the river bed. On the west side the excavations are within 25 feet of the river. The general plan of the tunnel is already known. Single passages, for horse and foot separately, are built to the water's edge, where the passage is doubled for the carriage way, extending 220 feet, one side for going east, and the other side for going west, thus preventing any danger of collision. The footpath is six feet above the carriage road, in the middle of the tunnel. When all the arches are completed the top is to be covered with masonry, making all level; over this will be a coating of government asphaltum, poured on hot, and thus running into and filling all the seams, and forming a water-tight sheeting; over this, again, large, heavy flag stones, of the usual white stone are to be laid, and the joints filled with asphaltum. Then the water is allowed to flow over all. Between each course of brick in the arches is a half inch of cement. Beneath the center of the passage-way, under foot, is a sewer 120 feet long—over 100 feet of which is now built—leading to a well in the center of the tunnel bottom, into which all water accumulating in the tunnel flows, and is pumped up by a powerful engine to the surface and back to the river. The cost of the tunnel for material and labor is about $8,000 per week. The original contract was $328,500, but the actual cost will be not less than $500,000.

Carbonization of Wood.

M. Gillot, in his memoir to the French Academy of Sciences on this subject, says, the only of condition essential for the production of good charcoal is, that the operation shall proceed slowly. The decomposition of wood commences at about the boiling point of water. During the decomposition the production of carbonic acid causes a development of heat in the retort greater than that out of it, when the heat applied approaches 300°C. Too rapid an increase of internal heat gives rise to the formation of tar and gaseous products diminishing in a corresponding degree the useful accessory products, as well as the yield of charcoal. The condensed products contain the largest proportion of acetic acid (about 28 per cent.) when the temperature of the oven is 218°C. In this way a given amount of wood will yield about two-thirds in weight of charcoal, and 7 or 8 per cent of acetic acid.

WOODSIDE'S PATENT SELF-SETTING ANIMAL TRAP.

The destruction of vermin seems to be a necessary condition of human comfort. and although the process appears, at times,



to be cruel, yet it is difficult to see how it can be avoided. The engraving presents a view of a self-setting trap, intended as a trap for catching wild animals as well as our domestic vermin. The description of the engraving, as applicable to rats, will suffice to explain its employment for other purposes. It is, in fact, an adaptation of the guillotine, the broad, decapitating knife being replaced by two blades intended for piercing the necks of the animals. It is fixed for rats, on a bench or table, in front of which stands a tub or bucket of water to receive the victims.

The lower part of the frame has an opening sufficiently large to admit the head of a rat, and over it is a slide or crosshead, A, having fixed to it two knives, B, guided through suitable slots, in the head piece, C. The crosshead is attached by means of a pitman to a crank, D, on a horizontal shaft at the top of the frame, on which is coiled a line suspending a weight, E, the falling of which allows the crosshead to fall when the rat releases the catch holding the shaft, and also raises it again instantly, thus resetting the trap.

On the horizontal shaft is a cam or single-toothed ratchet, F, the point of which engages with a snug on an upright sliding bar, pivoted at its lower end to a crank, to the shaft of which is secured a bait hook, G, inside the trap. A guard of wire net, or other material, prevents the rat from reaching the bait, except through the opening, on the side, C, under the knives. When the bait is tampered with, the snug on the upright sliding rod is disengaged from the catch of the cam, F, allowing the shaft to revolve and the crosshead, with attached knives, to fall. The snug on the upright sliding rod also engages with a projection on the rear of a pivoted hook, H, and, when disengaged, partially revolves the hook, throwing its long arm under the cam, F, which, as it swiftly revolves, throws the hook, H, back into place and resets the trap by raising again the upright sliding rod.

The operation can be readily understood from the above description. The weight, E, brings the knife block down with great rapidity, and it is so rapidly raised again, that, as the inventor states, the blood of the rat does not have time to stain the knives and deter others from taking the place of the victim, who rolls over into the bucket of water. The handle, I, is for winding up the weight.

This device was patented through the Scientific American Patent Agency, April 28, 1868, by Wm. J. Woodside, who may be addressed at Zanesville, Ohio.

Machine for Recording Votes.

The *Post* thus describes the new vote-recording machine which, we are informed, is to be used in the Assembly Chamber at Albany:

"By means of the machine which is to be put up in the Assembly Chamber the members will vote simultaneously. There is a dial like a large face of a clock to indicate the yeas, and another to indicate the nays. These dials contain the numbers of all the members, and each pulls a knob, communicating by a wire, as the bells do in a hotel, with the dial; his number flies out as he pulls, and he sees that his vote is recorded. If he desires to change his vote he does so by a request to the clerk.

"By turning a little crank the hand on the dial is made to point out the number of votes that have been cast both for and against the bill; and by another simple process the names of those voting both in the affirmative and negative are printed for the use of the clerk on a slip of paper. The whole process of taking the vote, recording it, and printing the name does not require more than half a minute. In that way over a hundred bills can be passed in an hour."

It is computed that this machine will be a great saving to the State in shortening the sessions of the Legislature. Certainly it will save the clerk's lungs.

RUSKIN, the eminent art author of England, who has lately turned his attention to political economy, in a recent letter urges the purchase of all the railroads in England by the Government. He argues that private persons should not be permitted to own the railroads of a nation; that all means of public transit should be provided at public expense; that neither railroads nor canals should ever pay dividends to anybody, but should pay their working expenses and no more, and that the whole work of carrying persons or goods should be done as the carriage of letters is now done.

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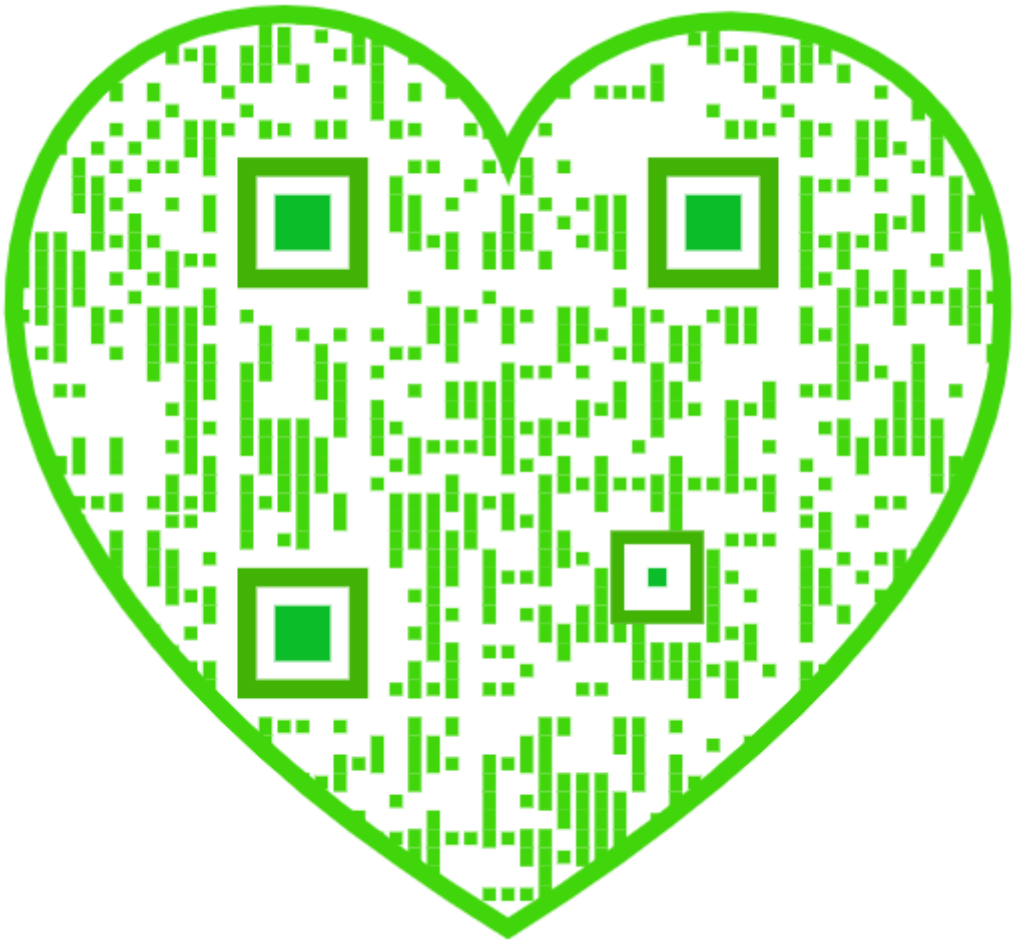

MANUFACTURE OF CAST STEEL AND HOMONOGENEOUS IRON.

In treating puddled steel, raw steel, and puddled iron, for the production of cast steel and homogeneous iron, the material to be treated has usually been (at great expense) balled and shingled to clear it from the cinder, and subsequently generally rolled into bars, cut up in pieces, and remelted. According to an invention recently patented by Mr. John Gjers, of Middlesborough, when crude iron or refined iron is caused through the action of iron cinder or other additional matter to boil and to come to nature, the material is transferred under treatment from the puddling even before the process of balling. By remelting or keeping fluid the material, it is caused to separate from the cinder and to attain a uniform quality ready to run into ingots. Thus Mr. Gjers melts crude pig iron, or refined iron, or recarbonized puddled iron, and works it in the usual way in a puddling furnace, and causes it through the action of rich pure iron cinder or other additional matter commonly used when making puddled steel—such for instance as manganese and salt—to boil and to come to nature in the manner adopted for making puddled steel or puddled iron. At or before the stage called top boil, just before the metal begins to thicken and to come to nature, but before the stage when it is fit or ready for balling up, the material under treatment is tapped with as much of the cinder as cannot at this period of the process be separated. It is transferred into a receptacle, in a reverberatory furnace on Siemens' regenerative principle. It may also be run on to the open hearth of a reverberatory gas furnace which may be either on Siemens' regenerative plan, or on the blowpipe plan in which gas is used in conjunction with a hot blast. The essential feature of the furnace to be employed is that it should be capable of producing a temperature sufficiently high to melt steel or homogeneous iron, and it is also important that the flame should be capable of regulation to either an oxidizing or a carbonizing flame.

Here, in the reverberatory furnace, Mr. Gjers allows the transferred metal in a fluid state to remain at rest for a length of time, exposed to a neutral or to a carbonizing or an oxidizing heat, according as the crude steel metal requires more or less decarbonizing; the heat being sufficient to keep it perfectly fluid until the metal has thoroughly separated from the cinder, which will float on the top, and until it has arrived at the requisite point of carbonization to form the steel or homogeneous iron which may now be tapped into ingot molds. Or the cinder may first be tapped or removed, and other flux (such as oxides of iron and manganese in the shape of pure ores of those metals) may if necessary be added to assist in decarbonizing and to protect the metal. To the metal may be added a certain quantity of either wrought or crude iron, of the shape of spiegel iron or other matter (manganiferous) so as to arrive at the point of carbonization and temper desired.

As far as possible the process is regulated, so that the transference from the puddling furnace may be made at such a period of the coming to nature, as will enable the metal after having been made thoroughly fluid and remained so sufficiently long to decarbonize in the reverberatory furnace, to be obtained without addition of malleable iron or ore at the degree of carbonization desired. If the proper precautions are taken to boil and to work the iron well in a suitable cinder in the puddling furnace, it will generally be pure enough for steel. At the last stage of fluidity, while it is yet fluid enough to run, and just when it is about to congeal or come to nature, it still contains about two per cent too much carbon. By transferring and exposing it, for three or four hours, in the reverberatory furnace in a liquid state to a neutral or slightly oxidizing flame under a cover of oxidizing cinder, this excess of carbon gradually works off; and when it is worked down to the point desired (which may be ascertained by testing samples), it is tapped into ingots. To temper and improve the steel or homogeneous iron, in most cases, before tapping the metal, a small proportion of manganese in some of its combinations is added.

It has been found beneficial to let the metal decarbonize to an extent slightly below the desired degree of carbonization of the steel or homogeneous iron, and then to improve and recarbonize the metal by adding a small proportion of spiegel iron, amounting to about 1 per cent of the whole. The carbon may, in some cases, be partly reduced by the addition of wrought iron, or, it may be, other malleable iron in any form containing less carbon than the desired steel. In practice, it has been found advantageous for this purpose to make use of scrap bars, blooms, or balls in a heated state, which are gradually introduced and melted with the fluid metal tapped from the puddling furnace. In some cases, cast steel or homogeneous iron is made by using ordinary puddle balls in combination with the fluid metal tapped from the puddling furnace, for which purpose it is found convenient to partially tap or transfer the contents of the puddling furnace just before the metal comes to nature, and to allow one half, less or more, of its contents to run into the reverberatory melting furnace. The rest may be allowed to continue working in the puddling furnace until it has thoroughly come to nature, and has become malleable, and the cinder has dropped, when it may be transferred either by shovels or in lumps and added to the fluid metal, previously tapped from the puddling furnace, on to the hearth of the reverberatory melting furnace.

The whole of the metal thus mixed, after being thoroughly fluided and brought to the desired point of carbonization in the reverberatory steel melting furnace, may then be run into ingots. Or four or more puddling furnaces may be employed to one melting furnace, and the entire contents of one or several of the puddling furnaces may be transferred before the period of coming to nature, while yet fluid, and the contents of the remaining furnaces may be transferred after the contents have got into nature; the entire contents of the whole of the puddling furnaces may then be melted together in the steel melting furnace. Or the crude steel metal tapped from the puddling furnace, at the period named, may, particularly when it is desired to treat it in crucibles, be run into molds as flat cakes, which, being broken in pieces, may be remelted in crucibles (or in the reverberatory furnace), in conjunction with malleable iron or with iron ore, to form steel.—*The Mechanics' Magazine.*

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents

For the Scientific American.

VERSIFICATION BY AN ANTIQUARIAN OF THE HINDOO COSMOGENY OF THE TEN AVATARAS,

THEY BEING THE SACRED BOOKS AND TRADITIONS OF THE HINDOOS.

The Fish denotes the fatal day
When Earth beneath the waters lay.

The Bull's the emblem of the God
Who raised again the mighty clod.

The amphibious Reptile marks the time
When it began the shores to climb.

The Lion King and savage trains
Now roam the woods or graze the plains.

Next little Man begins his reign
O'er earth and sky and watery main.

Ram with ax then takes his stand,
Fells the thick forest—clears the land.

Ram with plow turns up the soil,
And teaches men for food to toil.

Ram with bow 'gainst tyrants fights,
And thus defends the people's rights.

Budha for reformation came,
And formed a sect well known to fame.

When Kalki mounts his milk-white steed,
Heaven, Earth, and all! will then recede.

According to the Hindoo theology the duration of the universe consists of ten periods or Avataras, the first of which is 432,000 years, the second is 2×432,000, the third 3×432,000, and so on, and the tenth of 10×432,000 years. And the total duration from creation to destruction will be 23,760 000 years. Now it is not a little singular that the number 432 is considered in the East as a sacred or mystic number, and was so regarded by the ancient Chaldeans, Egyptians, and others Again, if we add together the numbers 1, 2, 3, and 4, the sum will be 10 (or the ten avataras). Again, the earth has four magnetic poles, which revolve around the pole of the earth, approximately in the following periods: the first in 1×432 years; the second in 2×432, 864 years; the third in 3×432, or 1,296 years; and the fourth in 4×432, or 1,728 years. The least common multiple of these numbers is 5,184, which multiplied by the half of ten, gives 25,920 years, which is very nearly the period that it takes the pole of the earth to revolve around the pole of the ecliptic, which gives rise to the precession of the equinoxes. Hence we may infer that the ancients were acquainted with these grand phenomena. I will now offer the following suggestions as to why the number 432 and its multiples and sub-multiples were considered sacred by the ancients. The following table will exhibit in part my explanation:

$$432 = 3\times144 = 3\times12^2$$
$$864 = 6\times144 = 6\times12^2$$
$$1296 = 9\times144 = 9\times12^2$$
$$1728 = 12\times144 = 12^3$$

The number twelve is everywhere used in the Bible as a sacred or mystic number. Hence we have the 12 sons of Jacob, the 12 tribes of Israel, the 12 apostles of our Savior, the ten commandments delivered to Moses which were completed by the Lord by adding two more to them, thus making 12 in all; showing a completeness, a fullness, not represented by any other number. Again, the dimensions of the most holy altar in the temple of Solomon was four-square, and its measure was 12×12×4. And the molten sea was supported by 12 oxen. The seventh chapter of Revelation says that 144,000 of the tribes of Israel were sealed with the seal of the living God, and in the fourteenth chapter, that 144,000 of the redeemed praised God before the 4 beasts and the elders, and in the twenty-first chapter we find a description of the New Jerusalem, which is 4 square, has 12 gates, and the length and breadth and the hight thereof are all equal, and he found the measure to be 12,000 furlongs. Then the contents must be cube of 12,000, or 1,728,000,000,000. These analogies tend to show why the ancients regarded the number 432 as sacred. Again, the sacred tradition and prophecies of every race and nation were doubtless dictated by extatics long before the art of writing was invented. Is it to be supposed that their prophecies and visions were lost? By no means. They mapped them in the skies, among those fixed and unchangeable stars which glitter in the heavens above—a record that never changes and will last until time shall be no more. If we cast our eyes to the heavens we will see there illustrated the foregoing beautiful lines. Who cannot see the universal deluge when the earth was beneath the waters, in the water bearer who is pouring out a flood in which the fish do swim and the ship (Noah's Ark) is tossed by its tumultuous waves. These constellations are plainly mapped out. Again, the reptile crawling on the dry land is nothing more than the serpent that tempted Eve, and is represented in the heavens by a great serpent which is pursuing a woman to devour her. In the ancient charts she is represented with a child in her arms and is flying into the wilderness. Is this not mother Eve, and is it not typical of the flight of the Virgin into Egypt, which is also strikingly told in the twelfth chapter of Revelation? Then follows the animal kingdom, which is also mentioned in our Bible, and they are represented in the heavens by the constellations of the lion, the bear, the bull, the goat, the horse, the dog, the sheep, the dove, the raven, the swan, the eagle, the wolf, etc. At length Man appears the master of creation. This is precisely in accord with our Bible. And it was for this reason that the ancients represented a man as surrounded by the 12 signs of the zodiac, each sign corresponding to one of his members. We see this figure printed in our common almanacs, which is probably older than the pyramids of Egypt, and as ancient as theology itself. Then Ram appears—"He fells the forest, tills the ground." (Ram is a Hindoo god, and his name is often found in ancient history as an affix or a suffix to proper names, as Ram-ises, Semi Ramis, etc.) This is doubtless an emblem of Cain. He too is represented in the heavens by the constellation of husbandman or Bootes, who is a cultivator of the vine. He is represented as holding a club, emblematic of his wicked disposition, for we are told that he slew his brother Abel. Abel is also represented in the heavens by the constellation of Auriga, who holds a kid in his arms. The position of these two constellation in the heavenly sphere are so nearly opposite each other that it is presumable that they were so mapped out to show how different in character were Cain and Abel, or in other words, good and evil. Then "Ram with bow" is an emblem of both Nimrod and Sampson, and are seen represented in the heavens by those beautiful constellations Orion and Hercules. Then Budha appears as a redeemer. Is this not another name for our Savior, who is also represented in the ancient charts of the heavens by a child in the arms of a virgin. And lastly, in the grand drama, Kalki appears, "mounted on his milk white steed." This can be no other than the white horse mentioned in the sixth chapter of Revelation, and called "Death on the pale horse." And again, in chapter xix., where the heavens are opened and a white horse appears, and his rider is called Faithful and True. This is also represented in the heavens by the constellation of Pegasus, on which Perseus rode to the rescue of the princess Cassiopeia, who was chained to a rock and about to be devoured by a great sea dragon. The first meridian of the heavens passes only 6 min. 26 sec., or 1° 38′ 30″ to the eastward of the bright star Algeneb, one of the stars forming the Square of Pegasus. Now the precession of the equinoxes carries the first meridian to the eastward at the rate of about 50½″ per year; consequently Algeneb must have been on that meridian about 117 years ago. The square city spoken of in Revelation is beautifully represented by the square of Pegasus. The first meridian has already entered that city, and is gradually advancing towards the citadel, the heart of Pegasus, which it will reach in about a thousand years. At the same time that it pierces the heart of Pegasus it will also pass through his rider, and then we may quote the prophecy of the ancient avataras:

"When Kalki mounts his milk-white steed,
Heaven, Earth, and all! will then recede."

Do we not see this illustrated before our eyes. Never has mankind made so much progress as during the last one hundred years (or since the first meridian entered into the square city). Faithful and True is preparing the white horse—he has already one foot in the stirrup—he will soon mount his milk-white steed. Kalki is beating the call to arms and knocking at the door of our hearts to rouse us to action. The city of the New Jerusalem is being adorned for the marriage with the brightest jewels of the minds and intellects of men. Her gates are standing ajar, and we can even now catch a glimpse into the glorious city whose fame is described in every sacred book ever written, and whose fair proportions are seen in the heavens represented by the Square of Pegasus. Thus we see that our Bible, the ancient Avataras, and the stars agree. And why should they not? Truth is one and universal. And I feel sure that if we could read the internal sense of all sacred books we would find them to agree perfectly. It is man alone who perverts them.

W. P. BUCKNER.

Center of Gravity in a Revolving Vertical Wheel.

MESSRS. EDITORS:—On behalf of the members of this Institute, I take the liberty of asking you to say, through your able columns, whether the enclosed theory regarding a vertical wheel in motion is true; and if it is true whether it has now been introduced for the first time, as Mr. McCarroll of this city professes himself to be the discoverer of it.

O. J. SWEGLES,
President Buffalo Mechanics' Institute.

The theory and its attempted demonstration are given as follows, by Mr. James O'Riordan in a communication to some newspaper, the name of which our correspondent has withheld.

We have no recollection of seeing this theory before, but in a paragraph attached to the slip containing the communication of Mr. O'Riordan, we find a statement that it was formerly submitted to us, and a charge that we treated the subject in a way that seemed to show want of appreciation of its merits. There is no doubt that we should have dismissed the subject as unworthy serious discussion, had it come to us in the way of ordinary correspondence. We would do so now had it come from a private source, as we deem it of no practical value, and we exceedingly dislike to cumber our pages with purely theoretical discussion. We will however for this once make an exception in favor of this communication, and endeavor to show the entire fallacy of the doctrine, as therein set forth.

MATTEAWAN, Aug. 3d, 1868.

In reply to your query of the wheel, viz., "Whether the weight of a vertical wheel, when in motion, rests on the same point as when in repose."

It does not. The point on which the weight rests—the center of gravity—recedes from the center and approaches nearer to the periphery of the de-

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scending half of the wheel, and the greater the velocity the nearer it approaches to it, but can never reach to or beyond it.

Proof. When the wheel is at rest, and of uniform density, by the laws of gravitation each particle of which it is composed is of equal weight. Then equilibrium is produced—the center of gravity coincides with the center of the wheel—and on all sides there are equal momenta.

Now let us see whether such is the case when the wheel is in motion. It is evident that as the wheel revolves each particle has a tendency, owing to centrifugal force, to fly off in tangents to the circles they describe. This eventually would occur were it not for the attractions of cohesion and gravitation; the former keeping the mass or particles of matter together, and the latter drawing them towards the earth, and consequently giving them weight.

Again, as each particle revolves in succession from the lower to the upper point of the periphery, or through the ascending half of the wheel, they lose a portion of their weight equal to the centrifugal force given to them in opposition to gravitation. Each particle having a tendency to fly off in opposition to gravitation at one hundred and seventy-nine different angles, which undoubtedly causes them to be relatively lighter than when at rest. While on the contrary, as the particles revolve from top to bottom, or through the descending half, they have, in addition to their original weight (given by gravitation) when at rest, the centrifugal force given by the motion of the wheel, which proves clearly that the descending portion of the wheel is actually heavier than the ascending half. So what the ascending half has lost by motion, the descending half has gained to the same amount. And so to preserve the laws of mechanics—equilibrium and momenta—the center of gravity must part from the center of the wheel and approach the descending, the heavier periphery leaving a number of its particles to the lighter side to compensate for what it lost by centrifugal force.

As I have said, the greater the velocity the further the center of gravity departs from the center of the wheel, for the greater the centrifugal force the greater the difference between the weights of the ascending and descending parts of the wheel, and consequently the nearer it must approach the heavier periphery to equalize this difference and to produce equilibrium. But as the wheel is retarded, or the velocity ceases, the center of gravity approaches nearer and nearer, till finally it coincides with the center of the wheel, the motion ceases; then the wheel is at rest, and I will rest too.

Yours truly

JAMES O'RIORDAN.

This so-called proof is open to criticism, upon use of terms as well as incorrect reasoning; but as we wish to discuss this matter in a spirit of candor, and to avoid anything that should seem like ridicule, we shall confine ourselves entirely to the point at issue.

The *reductio ad absurdum* is a method of reasoning that has been considered of great service in mathematical investigation, and is equally valuable in the determination of mechanical principles. If, then, the theory that the center of gravity in a vertical revolving wheel is moved from the center of revolution towards the descending half of the wheel, conflicts with established facts, the theory itself must be erroneous, or the facts are no longer to be considered as facts. Nothing in mechanics, however, has been more surely established than the facts with which this theory conflicts, and as facts are dearer to us than any theory, however plausible, we are perforce compelled to deny the truth of the proposition in question.

By this theory one side of a vertical wheel, when revolving, is always heavier than the other side, provided the wheel be balanced when at rest. This being admitted, of course the centre of gravity is always outside the center of revolution; and as long as the wheel revolves in one direction, it is always on the same side of the center of revolution. Like causes always produce like effects. The shifting of the center of gravity, outside the center of revolution, will, when a wheel is at rest, cause it to turn, provided the increased weight of one side, aided by the diminished weight of the other side, is sufficient to overcome the friction of its bearings. If this is constantly kept up, the wheel will constantly turn with increasing velocity, until it reaches the maximum velocity that can result from the given loading of one side. This occurs upon the common overshot water-wheel, the motion of which is kept up by constantly keeping the center of gravity outside the center of revolution upon one side in the continuous application of a weight of water to, and the discharging it from, that side. In a heavy wheel a slight change of the center of gravity to one side of the center of revolution is sufficient to turn it if nicely balanced. We were once employed to balance cylinders weighing 300 pounds each, intended to revolve 1,200 times per minute. With this speed the balancing had to be performed with the utmost nicety, and the bearings were so constructed for the purpose of accuracy, that the friction was the slightest possible. A difference of two ounces between the sides of these cylinders was sufficient to render them useless, and in balancing the weight of a tenpenny nail would set one of them in motion. Now these nicely balanced cylinders, according to the above theory, ought to have been perpetual motions. The weight of a nail would turn them, and it would be difficult to conceive of a shifting of the center of gravity so slight that it would make a less difference in weight upon one side of a wheel weighing 300 pounds than the weight of a single tenpenny nail. These cylinders, when set in motion, after being thus balanced, ought to have continued revolving for over when the belts were run off; but they did not, they always ceased moving as soon as their momentum had been exhausted by friction. The geniuses who have heretofore expended their time and money upon the problem of a perpetual motion, have—if this theory be correct—been altogether on the wrong track. Instead of attempting to throw wheels constantly out of balance, they should have endeavored to balance them perfectly. We might, as the lawyers say, rest here, but we will discuss the matter somewhat further, lest we should again be accused of not fully appreciating the merits of the case.

The error in the so-called proof of the theory, so positively asserted, lies in the assumption that the centrifugal force acts in opposition to the earth's attraction on the ascending side of the wheel and coöperates with it upon the descending side. It is true, as Mr. O'Riordan affirms, that the centrifugal force is opposed by two forces, the attractions of gravitation and cohesion; but the attraction of gravitation which thus assists cohesion is the gravitation of the particles of the wheel towards its *own center of gravity*, and not the earth's attraction upon those particles. The earth's attraction upon the different parts of the wheel is the same except the difference which results from variations in their distances from the earth's center, which may be left out of consideration as it does not affect the present question; and until motion should be increased so that the wheel would be thrown to pieces, it would not affect the motion of any of the parts, its entire force being concentrated upon the bearings and neutralized thereby. Thus it gives equal weight to both sides of the wheel, provided the sides are symmetrical and homogeneous, and as it is an established principle in physics that a force acts upon any body without regard to its being at rest or in motion, the earth's attraction would not affect the center of gravity in the mass, which does not depend upon the earth's attraction at any time or in any condition. The center of gravity in a mass is the point around which all the parts of the mass will, in any position, balance themselves, and its position would be the same were there no earth, or sun, or planets, and the vertical revolving wheel had the infinitude of space all to itself. It is true that the application of the earth's attraction, is the experimental test for determining the position of the center of gravity in a mass, but it is no less true that the position of the center of gravity is entirely independent of the influence of any external attraction.—EDS.

Solar Heat—Ericsson's Solar Engine.

MESSRS. EDITORS:—Your correspondent, "A," erroneously supposes that the subject of solar heat, as a mechanical motor, has not attracted due attention. Captain Ericsson at the centennial celebration of the University of Lund, in Sweden, last spring, forwarded to that ancient institution essays relating to the sun, showing that perfect uniformity of the rotation of the earth, is incompatible with solar influence and that solar heat may be so employed as to furnish an infinite amount of motive power for practical purposes. As the first part of the essay does not bear directly on the subject under consideration, I will pass over its contents merely observing that the philosophical faculty of the Swedish University at the centennial celebration alluded to, conferred on Captain Ericsson the degree of Honorary Doctor of Philosophy. Before presenting to the readers of the SCIENTIFIC AMERICAN a translation of the latter part of the essay, it will be proper to state that I have witnessed the operation of one of Ericsson's solar engines, to be actuated by atmospheric air heated by the direct intervention of concentrated solar heat. Your mechanical readers will be surprised on hearing that the working piston of the model engine makes upward of 300 strokes per minute.

The simplicity and moderate cost of the means devised to concentrate the solar heat are such that no practical difficulties present themselves to prevent the construction of solar engines of any desirable power. Much might be expected from the versatility of the constructor and his extraordinary mechanical resource; yet, the facility with which the radiant heat of the sun may be collected and concentrated from acres of surface, by the means contrived, will alike surprise and interest the mechanical and commercial community.

The following translation of the essential part of Captain Ericsson's communication to the philosophical faculty of Lund, cannot fail to interest your readers:

"I have, of late years, spent much time and considerable means on experiments to ascertain if the radiating heat of the sun can be concentrated in such a manner as to render it available for the production of motive power.

"Sir John Herschel's and Mr. Poullet's experiments relating to the radiating heat of the sun, although interesting, are not satisfactory as they only deal with low temperatures, showing how much ice may be melted, or what elevation of temperature of water under the boiling point may be effected in a given time on a given surface. The purpose of my investigations and experiments, on the other hand, has been to ascertain what amount of heat can be developed at the high temperature obtained by concentrating the solar rays, viz., bringing their power to bear on a reduced surface, and to devise the most efficient means for effecting such a concentration of the radiating heat. Apart from these preparatory experiments, I have also, at the commencement of the present year, constructed three different motors which I term *Solar Engines*. One of these is actuated by steam formed by the concentration of the heat of the solar rays, while the other two are actuated by the expansive force of atmospheric air heated directly by concentrated radiant heat. Time will not permit, nor is it my purpose on the present occasion, to present a description of these solar engines or the means adopted for concentrating the radiant heat in order to obtain the necessary high temperature. I will therefore limit my essay to the consideration of the essential part of the subject, viz., the motive force itself. With regard to this, I have briefly to state that my experiments show that, at the high temperature requisite for steam engines and caloric engines, the heating power of the sun on a surface 10 feet square will, although in *itself* too feeble, evaporate, on an average, 489 cubic inches of water in the hour, by means of my mechanical contrivance for effecting the necessary concentration. The importance of this result cannot be overestimated when we reflect that such an amount of evaporation demonstrates the presence of sufficient heat to develop a force capable of lifting 35,000 pounds one foot high in a minute, thus exceeding one horse power. As an incontrovertible evidence of the capability of the sun to develop a great amount of heat at high temperatures, this result is probably of greater importance than any other physical truth practically established.

"The mean distance from the center of the sun to the earth being 214·44 times greater than the radius of the former, it will be found by squaring this sum, that *one* superficial foot of the sun's surface must heat 45,984 superficial feet of the earth. In other words, the sun on an equal surface throws off 45,984 times more heat than the earth receives. We are therefore enabled, on the strength of the practical result now positively established, to infer, that an area of 10 feet square on the sun's surface develops heat enough to actuate a steam engine, not a *theoretical* one with its small consumption, but a real steam engine of 45,984 horse power, demanding a consumption of more than 100,000 pounds of coal every hour. But this estimate, based on the evaporation effected by the concentrated radiant heat, is far below the actual development of heat by the sun. Fully one half of the heat conveyed by the solar rays is lost during their passage through the atmosphere and through the apparatus by which the temperature is elevated to the necessary high degree. The actual development of heat, on the supposed 10 feet square of the surface of the sun, will therefore equal the amount of heat generated by the consumption of 200,000 pounds of coal per hour. The mind cannot conceive the intensity which must accompany such an inordinate consumption in so small a space. Still less can we form an idea of the nature of the combustibles or their sufficiency, when such an intense heat is perpetually kept up on the entire surface of a globe the diameter of which is more than a hundred times greater than that of the earth. But it is not my intention on this occasion to lay before the philosophical faculty my speculations regarding the properties of this wonderful orb; I have only designed to discuss the question as to the sufficiency of the radiant heat notwithstanding the enormous distance, and the use we can make of it as a mechanical motor. The result of my experiments, as already stated, having established the fact that without an inconvenient extension of the mechanism which I have devised for concentrating the radiant heat, sufficient power can be obtained for practical purposes, it will now be proper to point out what amount of mechanical power may be obtained by occupying a Swedish square mile with solar engines. Assume that one half of the area is set aside for necessary roads, houses, etc., an available area would remain of 18,000 x 36,000—648,000,000 superficial feet on which the radiant heat might be concentrated. My several experiments having shown that the concentration of the solar heat on 100 square feet of surface is more than sufficient to develop a horse power, it follows that 64,800 engines, each of 100 horse power, may be kept in motion by the radiant heat of the sun on a Swedish square mile.

"Archimedes enthusiastically exclaimed that his favorite device, the lever, had power enough to heave the earth out of its path. It may be more truly said, that the concentration of the radiant heat of the sun furnishes sufficient force to stop the earth in its course.

"I cannot omit adverting to the insignificance of the dynamic energy which the entire exhaustion of our coal fields would produce, compared with the incalculable amount of force at our command, if we avail ourselves of the concentrated heat of the solar rays. Already Englishmen have estimated the near approach of the time when the supply of coal will end, although their mines, so to speak, have just been opened. A couple of thousand years, drops in the ocean of time, will completely exhaust the coal fields of Europe unless, in the meantime, the heat of the sun be employed. It is true, that the solar heat is often prevented from reaching the earth. On the other hand, the skillful engineer knows many ways of laying up a supply when the sky is clear and that great store house is opened where the fuel may be obtained free of cost and transportation. At the same time a great portion of our planet enjoys perpetual sunshine. The field therefore awaiting the application of the solar engine is almost beyond computation, while the source of its power is boundless.

"Enough, I trust, has been said to enable the philosophical faculty to judge of the importance of the subject; but who can foresee what influence an inexhaustible motive power will exercise on civilization and the capability of the earth to supply the wants of our race?"

The foregoing translation is sufficiently explanatory to enable the reader to understand clearly the general features of the subject. I will therefore merely add, that Captain Ericsson is pushing the stupendous scheme with such vigor, that, before the termination of the present season, bread will be prepared from flour ground by the power of his solar engine.

Yours very respectfully,

C H. DELAMATER.

Removing Chuck Cement from Lathe Work.

MESSRS. EDITORS:—I notice one of your correspondents is troubled about removing the "wax" or "lac" from his work, after taking it from the lathe.

With an experience of many years, perhaps I can relieve your correspondent of his trouble by giving him my method. On removing the piece from the lathe, I warm it over a spirit lamp, then tap it with a stiff brush, lightly; the wax will adhere to the brush. By repeating the operation, there is but little left for the alcohol to do. If in a great hurry a few seconds' boiling in alcohol will remove the balance, or it can be put in alcohol, without boiling, a few minutes, while the time is employed on other parts of the watch, when the piece is cleaned with ease. Hoping the above will benefit some of my brother "chips," I remain,

Eufaula, Ala. S. S. BARNABY.

PROF. GAMGEE has made a report to the effect that one-fifth of the meat eaten in Great Britain, whether beef, mutton, veal, or lamb, is diseased. Prof Gerlach states that half the meat consumed in Berlin is diseased. How about the United States? The butchers in New York say the demand for beef has largely diminished in consequence of popular doubt upon this point.

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SPECIAL CORRESPONDENCE OF THE SCIENTIFIC AMERICAN.—AFFAIRS AT THE PATENT OFFICE.

WASHINGTON, D. C., Sept. 2, 1868.

You have already announced that Commissioner Foote is hard at work reorganizing the business of the Patent Office. His reform promises to be very thorough. Laziness is a thing not to be tolerated any more, expenses will be cut cut down to the lowest figure, and the Office be put upon a thorough working basis. The practice of paying forty-eight dollars per thousand for manilla envelopes has been discontinued, and the daubing over of stone columns with cobalt blue is not likely to be repeated at present. The Commissioner has made several changes relative to preparing the annual report, printing specifications, etc., which will greatly reduce the expenses, and advance the true interests of the office.

Among other reforms introduced, is that of examination of examiners, to see if they are qualified for their duties W. B. Taylor and J.W. Jayne, Examiners, and B. F. James, of the Appeal Board, are appointed to examine applicants for positions in the Office, and hereafter, before any appointment can be made the candidate will be thoroughly examined as to his fitness for the place. He must possess at least some show of qualification or he cannot be appointed. All those now in the Office will have to submit to this examination, and if found unqualified will be discharged. They must have on the wedding garment or they cannot sit at the feast.

The Commissioner intends to raise the standard of principal examiners to that of the judges of our common courts, and means to do away with the practice heretofore in vogue of appointing persons to positions simply because they happen to be related to some M. C. or Senator.

It is not stated whether any examination as to moral qualification is to be made, but it will do the candidates no harm to put to them a few questions from "Watts on the Mind," and the old-fashioned "Westminster Catechism," books too much neglected by officials now-a-days. There is considerable interest felt about this new procedure, and it is already reported that some of the officials with hair erect, are expecting momentarily to be summoned before the new Tribunal. Mr. Taylor, who has had long experience in examining shooting irons, is expected to throw in some sharp shots. Judge James will apply the legal rules, and Mr. Jayne will do his share of the heavy work. The board is really a very able one, and Commissioner Foote has shown wisdom in making the selection. The board will soon organize, and proceed *secundum artem*.

You have, for some time, been aware of the fact that the Examiners have been seriously hampered for room in which to transact their business, and owing to the lack of a little gumption on the part of former Commissioners, no efforts were made to remove the clog. I am happy to say that five rooms in the basement formerly occupied by the Agricultural Department, have been turned over to the Patent Office, and will be occupied by the chemical department under Professor Hedrick and other purposes.

The appointment of Judge Foote to the Commissionership, will do much to break up some mischievous cliques, which have swarmed about the Office like hungry flies—this class of which I am now speaking are really a serious pest, and it wants a high-toned Commissioner to keep them in their proper places, and to teach them that the Patent Office can be managed without their assistance and advice.

The Office will soon be all that inventors have a right to expect; and that their claims will be liberally treated, no one need fear or doubt. Judge Foote is a warm friend to the inventor.

There is a report that Mr. Grinnell, at present an examiner, is to take the place of Gen. Stout, as Chief Clerk, but I think this is somewhat premature. Gen. Stout is now absent, and it is not likely that any change will be made, if at all, until his return.

After a very severe contest the Commissioner has decided to extend the Haywood India Rubber Patent, which is considered to be very valuable. COMMUNE BONUM.

Chemical and Technical Prizes.

The *Société d'Encouragement pour l'Encouragement pour l'Industrie Nationale* of Paris has established the following prizes for solving the subjoined questions. The details may be found in the *Programme des Prix et Medailles mis en Concours de la Société d'Encouragement, Paris, rue Bonaparte No.* 44 (1867).

1. 2,000 francs for an improved method for preparing oxygen on a large scale. (Answer in 1869).
2. 3,000 francs for a technical application of binoxide of hydrogen. (Answer in 1869).
3. 3,000 francs for a cheap method for preparing ozone. (Answer in 1871).
4. 2,000 francs for converting the nitrogen of the atmosphere into a stable form, as nitric acid or ammonia. (Answer in 1869).
5. 2,000 francs for manufacturing cyanides by the aid of atmospheric nitrogen alone. (Answer in 1871).
6. 3,000 francs for manufacturing oil of vitriol *without* arsenic from pyrites. (Answer in 1870).
7. 1,000 francs for technical application of some common and cheap mineral substance. (Answer in 1868).
8. 1,000 francs for rendering valuable the various residues of manufactories. (Answer in 1869).
9. 1,000 francs for useful applications of the newly discovered metals—thallium, magnesium, indium. (Answer in 1870).
10. 1,000 francs for the same of non-metallic elements, as silicium, borax, bromine, iodine, selenium, phosphorus. (Answer in 1870).
11. 1,000 francs for the discovery of a new and valuable alloy. (Answer in 1871).
12. 3,000 francs for the preparation of artificial plumbago adapted for lead-pencils. (Answer in 1872).
13. 3,000 francs for producing artificial black compact diamonds. (Answer in 1872).
14. 4,000 francs for discovering a process by which useful organic substances, such as quinia, indigo, alizarine, cane-sugar, etc., may be manufactured. (Answer in 1872).
15. 4,000 francs for discovering a method for the artificial production of fatty acids or waxes. (Answer in 1874).
16. 6,000 francs for a method of manufacturing steel founded on reliable experiments. (Answer in 1872).
17. 5,000 francs for a method which disinfects the refuse matter of gas factories. (Answer in 1869).
18. 1,000 francs for a method which rapidly disinfects and clarifies the water of culverts. (Answer in 1868.)
19. 1,500 francs for an ink which does not injure steel pens. (Answer in 1868).
20. 3,000, 1,500, and 500 francs for the application of borax or boracic acid in pottery; for the discovery of new sources of boracic acid in France or her colonies, and for a composition which may replace boracic acid in the glazing of porcelain ware without increasing the cost. (Answer in 1868).
21. 1,000 francs for a practical application of dialysis. (Answer in 1868).
22. 1,000 francs for a practical application of dialysis to gases, such as separation of oxygen from air; distinction of noxious gases in confined spaces; discovering of a diaphragm, by means of which, in rooms lighted by gas and kept ventilated, to prevent explosion, the gas may be permitted to escape while the air is retained (?). (Answer in 1868).
23. 1,000 francs for the best mode of heating and at the same time ventilating rooms. (Answer in 1868).
24. 1,000 francs for a good filter for drinking water. (Answer in 1869).
25. 1,000 francs for a new and ready method by which fresh meat, game, or fish may be preserved at least for thirty days. (Answer in 1868).
26. 6,000 francs for a mode of permanent disinfection of water closets. (Answer in 1871).
27. 1,000 francs for practical introduction of Pasteur's method in the manufacture of vinegar. (Answer in 1868).
28. 2,000 francs for a book on the manufacture of wine, etc. (Answer in 1870).
29. 3,000 francs for the best apparatus to preserve and transport wine in. (Answer in 1870).

MODERN PENMANSHIP.

We gave last week some illustrations of the pictorial written languages of savages. A natural sequence to the train of thought suggested by that article, is the written language of modern times. In the written language of civilized nations we find arbitrary characters, representing sounds which, in combination, are used to represent things and ideas. The history of these characters contains many matters of interest; but in the present article we wish to confine ourselves to the discussion of the forms of the letters used in modern penmanship, and to show that the observance of these forms entails a large amount of useless labor, which renders the system inadequate to modern business exigencies. We further believe that the conventional forms of which we speak are capable of modification, so as to be equally legible while they could be far more rapidly written. The two great elements which are of vital importance in business penmanship, are rapidity and legibility. We hold that artistic forms have no claims whatever which ought to demand consideration, when they hinder the attainment of the former requisites. The business of job printing owes its prosperity largely to the inefficiency of modern penmanship. The best and most learned men of our age have lamented the waste of time forced upon them by the labor of writing, and have advocated the adoption of a less complicated system of penmanship than the one in universal use.

Many have gone so far as to advocate the general use of phonography. The Hon. Thomas H. Benton said that an early knowledge of phonography would have saved him twenty years of hard labor. An English reviewer, speaking of this subject, says, "We require some means of bringing the operations of the mind and of the hand into closer correspondence." We are, however, of the opinion that there are many objections to the adaptation of the existing systems of shorthand for business purposes. The first and most obvious objection seems to be the necessity for the observance of the orthography of words in ordinary legal and business writing. The most popular systems of shorthand more or less ignore this necessity, and multiply the characters used in writing so that certain sounds expressed in the ordinary way by a combination of characters, are represented by symbols arbitrarily used for that purpose. We are aware that some modifications of these systems have been proposed, which render them more fit for business use than the reporting style, admitted by all authors to be unfit for that purpose. But the substitution of any of these systems for the old one would be too radical a change, and would be attended with obvious difficulties. The reform should commence with the alphabet now used, the aim being to gradually modify the forms of the letters, so as to divest them of the useless turns and flourishes which do not add to legibility, and, regardless of all artistic notions, to simplify their construction as much as possible. This it is quite possible to do, especially with the capitals. Scarcely one of these requires more than two-thirds the number of motions now required, to answer equally well, and to be read by any one who can read ordinary writing. In the course of time entirely new characters might be substituted, beginning first with the letters least used. The latter should be as simple as those now used in phonography; a single dash or curve, above or below the line upon the paper. Any one at all versed in the shorthand systems now used, will readily understand how the variations in the positions, angles and thickness of such primitive forms, can be multiplied so as to give the requisite number of characters. An alphabet may be made entirely of straight marks, each letter requiring but one motion, and differing from the others only in thickness, length, the angle it makes with the ruling of the paper, and its position above or below the line. Moreover, such an alphabet can be written with perfect legibility, and in much less time than the ordinary characters. But it is not necessary to limit ourselves to straight marks, and it would not be advisable to do so. The object in speaking of it in this connection was to show the entire practicability of eventually obtaining an alphabet, in which each letter should demand only a single motion instead of five or six, as is the case with many now in use.

The progress of the age depends so much upon the pen, that it is wrong to neglect any means that would facilitate the work of authors, editors, and the large class of those who spend their lives in clerical labor. But in this as in all other needed reforms we must make haste slowly, and it is on this account we recommend beginning with the simplification of the alphabet now used, rather than the attempt to at once adopt phonography, as advocated by many of our exchanges.

An African Rainstorm.

The following extract from the travels of the celebrated African hunter and explorer Mr. Baker, recently published, will give a good idea of the great rapidity with which rainstorms gather in tropical regions, and the enormous volumes of water which often fall in a few hours, filling the previously dry and arid beds of rivers, and causing inundations of proportions entirely unknown in more temperate climes.

"The cool night arrived, and I was lying half asleep upon my bed by the margin of the river, when I fancied I heard a rumbling like distant thunder; I had not heard such a sound for months, but a low, uninterrupted roll appeared to increase in volume, although far distant. Hardly had I raised my head to listen more attentively, when a confusion of voices arose from the Arab's camp, with a sound of many feet, and in a few minutes they rushed into my camp shouting to my men in the darkness, 'The river! The river!'

"We were up in an instant, and my interpreter, Mahomet, in a state of intense confusion, explained that the river was coming down, and that the supposed distant thunder was the roar of approaching water.

"Many of the people were asleep upon the clean sand of the river's bed; these were quickly awakened by the Arabs who rushed down the steep bank to save the skulls of my two hippopotami, that were exposed to dry. Hardly had they descended, when the sound of the river in the darkness beneath, told us that the water had arrived, and the men, dripping with wet, had just sufficient time to drag their heavy burdens up the bank. On the morning of the 24th of June, I stood on the banks of the noble Atbara river at the break of day. The wonder of the desert! yesterday there was a barren sheet of glaring sand, with a fringe of withered bush and trees upon its borders that cut the yellow expanse of the desert. For days we had journeyed along the exhausted bed of the river; all nature, even in nature's poverty, was most poor; no bush could burst a leaf; no tree could throw a shade; crisp gums crackled upon the stems of the mimosas, the sap dried upon the burst bark, sprung with the withering heat of the simoom. In one night there was a mysterious change—wonders of the mighty Nile!—an army of water was hastening to the wasted river; there was no drop of rain, no thunder cloud on the horizon to give hope, all had been dry and sultry; dust and desolation yesterday,—to-day a magnificent stream, some five hundred yards in width, and from fifteen to twenty feet in depth, flowing through the dreary desert! Bamboos and reeds, with trash of all kinds, were hurried along the muddy waters."

The Late Flood at Baltimore.

The *Baltimore Weekly Commercial* takes the ground that the late disastrous flood was caused by a storm wholly exceptional in its character, and argues that in the re-occupation of the fine water privileges, where so much damage was sustained, it should be so considered. It says:

"According to the best accounts that have come to us of the visitation in question, and after mature consideration, it seems to be the concurrent testimony that on the day the deluge came, a vast black cloud covered the country all the way from about Laurel and the region north of that point to the Pennsylvania line. A lady staying at the time some twelve miles to the north of the point named, stated that for two or three hours it was so dark, even at the window, as to make sewing difficult." This vast amount of water appears to have been discharged from the clouds almost simultaneously, and near the head waters of the streams so suddenly affected, there having been comparatively but a few drops observed at Ellicott's Mills when the water began to rise with such fearful rapidity there. Almost in the nature of a great water spout then, it was one of those unusual visitations—we repeat—such as might never occur again; and therefore, we say, considering all the circumstances, it is but a matter of course that those who have hitherto enjoyed the fine advantages of the streams alluded to, should put their power in requisition once more for business purposes."

LYONS, Michigan, has 100 acres of peppermint under cultivation, and has made this year 1000 pounds of pure oil, and is still at it. The oil is worth $8 a pound.

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TELEGRAPHING WITHOUT WIRES.

The *N. Y. Herald* publishes a long cock-and-bull story from a correspondent at Tonawanda, N. Y., detailing the marvelous discovery of a young man "of modest mien" in that town, of the name of James H. Mower. The invention purports to be an electrical screw or a method of telegraphing without wires. The account states that, after going through secret studies of electricity, chemistry, and all the sciences for three years, during which he encountered difficulties the mere mention of which would occupy two columns of our paper, this modest young man emerges from his obscurity and makes a trial of his invention on Lake Ontario with a pair of the newly-discovered apparatuses. These were each sunk in 25 feet of water, and placed 25 miles apart, in an exact mathematical straight line, extending precisely east and west. The parallel was obtained from the most accurate surveys by a skilled astronomer, because the slightest variation from the true line would have been fatal to success. The precise nature of the apparatus used is not stated; but we are told that, by means of a remarkable electrical machine of his own getting up, "but of too intricate a character to be described here," he generates an immense quantity "of a fluid of astonishing qualities, possessing all the desirable requisites to a quick and thorough decomposition of water."

"On the 10th of July, everything was got in position, the weather being calm and the water smooth. A scow from which to operate was anchored at each end. He then commenced to generate a powerful stream and an immense quantity of the decomposing fluid, which he stood ready to let loose upon the susceptible medium, a hundred radiating agents converging to a common center, all charged with electricity, and which were only waiting for the needed touch to speed the fluid upon its impulsive errand. At seventeen minutes past two o'clock he handled the operating screw and sent the following dispatch:

"'J. B. SPEARMAN—
"'Success at last is mine. JAMES H. MOWER.'

"At nineteen minutes past two o'clock, back came the response:

"'MR. MOWER—
"'The world will acknowledge your triumph. J. B. SPEARMAN.'

"Two hours were then spent in uninterrupted communication upon matters relating chiefly to the apparatus, its operations and disposition.

"As to the whole evolution of dispatching messages through water, using it as the only medium, without the aid of any wire or insulated conductor, it may be explained thus: The water at the point of contact with the fluid is decomposed in the first drop, when the chemical separation advances to the second globule and there effects a like change, communicating the evolution to the third, and so on in the line of transmission, always in the same stratum of water. Why this line of invariable decomposition is always east and west, Mr. Mower, as I remarked before, will not now disclose.

"It is impossible to overestimate the importance of this discovery—a discovery which will establish a perfect gridiron of ocean telegraphs between our Atlantic coast and Europe on the one hand, and the Pacific coast and China on the other. Obscure islands in the most neglected corners of the earth will be able to hold converse with civilization, and soon receive her quickening breath of industry and art. Every respectable seacoast newspaper can open its own channels of communication at an expense insignificant when compared with the present transatlantic rates. A thousand benefits will accrue to mankind, and it is hoped that, in their full fruition, the name of Mower will not be forgotten, for he has, indeed, electrified the world."

The suggestion of a telegraph without wires is very old. Our modest young man might have saved himself the labor of writing up his silly yarn, and given the pith of his story in much better style, by quoting, as follows, from Addison's article in the *Spectator*, published over 150 years ago:

"Strada, in one of his prolusions, gives an account of a chimerical correspondence between two friends, by the help of a certain loadstone which had such virtue in it, that if it touched two several needles, when one of the needles so touched began to move, the other, though at never so great a distance, moved at the same time, and in the same manner. He tells us that two friends, being each possessed of one of these needles, made a kind of dial plate, inscribing it with the four and twenty letters. They then fixed one of the needles on each of these plates in such a manner that it could move round without impediment. Upon their separating from one another into distant countries, they agreed to withdraw themselves into their closets at a certain hour of the day, and to converse by means of this their invention. Accordingly, when they were some hundred miles asunder, each of them shut himself up in his closet at the time appointed, and immediately cast his eye upon his dial plate. If he had a mind to write anything to his friend, he directed his needle to every letter that formed the words which he had occasion for, making a little pause at the end of every word or sentence, to avoid confusion. The friend in the meanwhile saw his own sympathetic needle moving of itself to every letter which that of his correspondent pointed at. By this means they talked together across a whole continent, and conveyed their thoughts to one another in an instant, over cities or mountains, seas or deserts."

Here is an almost exact description of Brett's needle telegraph as used for twenty years past in England, the essential difference being that, in order to make the two separated needles sympathetic, Mr. Bett is obliged to keep them constantly connected by means of a telegraph wire.

Rules for the Strength of Boilers.

The "Useful Information for Railway Men," written by Mr. W. G. Hamilton, for the Ramapo Wheel and Foundery Company, among many other valuable items of information, gives the following, regarding steam boilers. For the cylindrical parts:

To Find the Working Steam Pressure Due to a given Diameter, Thickness of Plate, and Quality of Joint:—RULE—Multiply thickness of plate in inches by 2, and by the working strength of the longitudinal joint in pounds, per square inch, and divide by the diameter in inches; quotient is working steam-pressure in pounds, per square inch.

To Find Thickness of Plate, Due to a given Diameter, Quality of Joint, and Working Pressure:—Multiply the working pressure in pounds, per square inch, by the diameter in inches, and divide the product by the working strength of the longitudinal joint in pounds, and by 2. The final quotient is the required thickness of plate in inches.

The ultimate or bursting pressure is five times the working pressure.

To Find Working Steam Pressure, Due to a given Diameter of Tie-Rod, and Area of Segment to be guarded by it:—Divide the working strength of the tie-rod in pounds, by the area of the segment in square inches; quotient is working steam pressure in pounds, per square inch.

To Find Thickness of Plates of Stayed Surfaces:—Multiply the square root of the pressure in pounds, per square inch, by the greatest distance between the stays in inches, and by ·008; product equals thickness of plate in inches.

To Find Area of Segment, Due to a given Diameter of Tie-Rod and Working Pressure:—Divide the working strength of the tie-rod in pounds, by the working pressure in pounds, per square inch; quotient is area of segment in square inches. Working tensile strength of best iron rods is seven-eighths inch diameter, 8,000 pounds; one inch diameter, 10,000 pounds; one and one-eighth inches diameter, 13,000 pounds. Deduct ten per cent if the rod is reduced by screwing.

To Find Dimensions of Stay Bolts:—Multiply area supported by stay in square inches by pressure of steam in pounds per square inch; the sum divided by 9,000 equals area of stay bolts in square inches, if the stay is thickened out where the screw is cut. If the screw is cut out of the body of the stay, divide by 6,000. Where stays are secured by keys, the stay at the end should be one and a quarter diameter of the body of the stay. Depth of cutter, 1·6 diameter of stay; thickness of cutter, 0·3 diameter of stay.

To Find Working Strength of a Roof-Stay (or Crown Bar) of given Dimensions, fixed in its Place:—Multiply thickness of stay at the center in inches, by the square of its depths at the center in inches, and by 30; divide the product by the length of the span in inches; quotient is working load in tuns equally distributed, when stay is fixed in its place.

Staying Locomotive Boilers.—Fire-Box Water Spaces:—Working pressure in pounds, per square inch, being one sixth of bursting pressure; stays, three-quarters inch diameter; copper plates, one-half inch thick; iron do., three-eighths inch thick.

STAY.	PLATE.		STAYS 5 IN. APART.	STAYS 4 IN. APART.
Copper	Copper	Screwed and riveted	107	185
Iron	Copper	Screwed and riveted	160	250
Iron	Copper	Screwed only	120	190
Iron	Iron	Screwed and riveted	185	290

For low pressure boilers, at twenty pounds per square inch flat portions should be stayed at intervals of twelve inches apart.

To Find the Pressure borne by the Roof-Stays (or Crown-Bars) of a Fire-Box:—Multiply span of the roof in inches, by the pitch of the stays in inches, and by the pressure in pounds per square inch, and divide by 2240; the product is the pressure uniformly distributed, borne by each roof-stay, in tuns.

Strength of Boiler Plates and Joints:—Working strength of best boiler plates are:

Yorkshire plates, per square inch of entire section	11,000 pounds.
Staffordshire	9,000 "
American	14,000 "
American, ordinary	12,000 "
Cast steel plates	18,000 "

Working Strength of Joint per Square Inch of Entire Section:

	BEST YORKSHIRE.	BEST STAFFORDSHIRE.	BEST AMERICAN.
Scarf-welded, joint	11,000	9,000	14,500
Double riveted, double welt	9,000	7,000	10,500
" " lap joint	8,000	6,500	9,750
Lap, welded joint	7,400	6,000	9,000
Double riveted, single welt	7,300	6,000	9,000
Single riveted lap	6,700	5,400	7,800

The strain per unit of length upon transverse circular joints is only half of that on longitudinal joints; longitudinal seams should therefore be the strongest, and the double-riveted double welt joints should be used for longitudinal joints, and the single-riveted lap joints for circular seams.

Riveting for Boilers.—Table of Dimensions of Rivets, etc., for Steam Boilers:

Thickness of Plate.	Diameter of Rivet.	Length of Rivet from head.	Distance apart of Rivets, Center to Center.	Breadth of lap, single riveting.
in.	n.	n.	in.	in.
3-16	⅜	⅝	1¼	1¼
¼	½	1⅛	1½	1½
5-16	⅝	1⅜	1⅝	1⅝
⅜	¾	1⅝	1¾	2
½	13-16	2¼	2	2¼
⅝	15-16	2¾	2¼	2¾
¾	1⅛	3¼	3	3¼

For double-riveted joints, add two thirds of the breadth of lap.

MR. RECHTEN, of Bremen, has been exhibiting the newly patented German whaling gun at New Bedford. The gun is double and very heavy, mounted on trunnions. One barrel is designed for a harpoon and the other for a bomb lance. The harpoon is said to have been thrown a long distance with great accuracy.

THE BESSEMER PROCESS---HOW ITS EARLY DIFFICULTIES WERE OVERCOME.

Before considering the conduct of the Bessemer process, i is necessary to bear in mind, 1st, that the grand value of Bessemer metal over puddled metal, is due to its being produced in a fluid state; 2d, that while cast iron is easily liquefied at a temperature of 3,000°, wrought iron or soft steel can only be kept liquid at a temperature of at least 5,000°, which is quite beyond the convenient and practicable capacities of fuel and furnace material as ordinarily employed.

For nearly a century, the partial decarburization of pig iron has been accomplished by blowing air upon (and in some cases into) a melted mass of it. But the liquidity of the mass was only maintained by contact with an intense coal fire. The combustion of the carbon by the air was so slow and so limited in extent, that the iron was rather chilled than heated by it. This was the "finery" process, and was merely preparatory to puddling; the product was still cast iron.

Some years before Bessemer began his experiments, Mr. William Kelly of Kentucky advanced the finery process by a great stride, but left it still far short of practical steel making. He blew air into the iron just smelted from the ore, and lying in the hearth of a blast furnace, and partially decarburized it, but not without the liquefying agency of the mass of fuel above. He afterwards blew streams of air into melted iron contained in a covered brick vessel or chamber, without fuel. The almost invariable chilling of the iron, after repeated experiments with various forms of apparatus, and extending over several years, led to the suspension of further trial in this direction. The subsequent success of the Bessemer process, however, revived the claims of Mr. Kelly. The precise legal status of the two inventors has not, fortunately for the public as well as for the parties immediately interested, been brought to test, the various interests having been combined.

At this point we are prepared for the inquiry—What is the Bessemer process? If the old finery did not fulfill the theoretical specification, Kelly's certainly did. Here were carbon and silicium in the iron, but all ready to leave it upon the heated appeal of oxygen; here was plentiful oxygen spread over and bubbling through it, and here was the ample heat of three thousand degrees. Still, the reactions were irregular and impracticable.

Just here, Mr. Bessemer introduced a radically new element, that made all the difference between failure and success. To describe his process as the introduction of oxygen into melted iron, is to play Hamlet without the prince. Bessemer's is not strictly a chemical process. The chemical reactions will look out for themselves, but they must have an adequate chance, and this is what Bessemer for the first time gave them, by mechanical means, viz.: the mechanical force of numerous blasts—not sluggish drafts, but roaring blasts of air, blowing the melted iron all into spray, so as to give the oxygen and the carbon hundreds of square feet of surface contact, so that every drop of iron should be enveloped with air. Thus, and thus only, the combustion is so perfect and rapid, and so diffused throughout the whole mass, that the two grand desiderata are attained—1st, the decarburization is effected without the use of other fuel; and 2d, the product is liquid and can be cast into homogeneous masses.

To accomplish these results, Mr. Bessemer developed the radically new machinery and apparatus which, with various extensions and modifications, is everywhere used. It consists principally of the converting vessels mounted on trunnions, and so shaped that the liquid metal can lie quietly in it while the tweeres (air admission) and the entrance or mouth of the vessel lie above the metal line, and so that the mouth becomes a chimney and the tweeres are brought beneath the metal, when the converter is turned upright. He also, after great trouble, developed a refractory material (chiefly silicious stone), and a mode of lining the converter adequate to the great heat and wear. The general arrangement of casting pit, ladle, ladle and ingot cranes, regulator, and other plan to be hereinafter described, were rapidly developed by Mr. Bessemer. During ten years of his first practice, he advanced the machinery of the new art to a much higher degree of perfection than has yet been attained to in the old processes.

But Mr. Bessemer had no sooner conquered this difficulty than he encountered another and equally serious one. Except when a few of the choicer irons were employed, entire decarburization left the product "red-short," or incapable of malleability at red heat, and therefore utterly useless. To stop the blowing at such a point as should leave in sufficient carbon to cure the red-shortedness and constitute a mild steel, was on the whole impracticable, because there is no adequate indication of degrees in decarburization, and the accuracy of blowing through a fixed time, would be impaired by varying heat and other circumstances. Here, then, were the impossibility of definite degrees of decarburization on the one hand, and the spoiling of the product by complete decarburization on the other hand.

In studying Mr. Bessemer's numerous patents and writings, we observe that he clearly understood this difficulty, and approached very near to its solution. Indeed, he rather vaguely described, in several patents, perhaps without seeing the end from the beginning, substantially the remedy afterwards patented by Mr. Robert Mushet.

The indications of complete decarburization by blowing air into melted iron, are as distinct as the time of day on the clock. The flame at the converter mouth suddenly decreases in volume and loses—not its own brightness, but its power of illuminating other things. But the product is valueless. Mr. Bessemer vaguely conceived, and Mr. Mushet definitely specified the finishing touch in the great art—re-carburization. A definite weight (three or seven per centum) of a pig iron, containing not only carbon but manganese (either Franklinite or

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Spiegeleisen), is melted and run into the decarburized iron. At this excessive temperature—not less than five thousand degrees—the oxygen and other impurities that make the iron red-short, come out of it with great commotion, and enter into the carbon and manganese thus added, forming an intense flame and copious slag. A part of the carbon combines with the iron, thus producing steel. All this is the work of a moment, and the thorough reaction is due to the excessive temperature. The oxygen which is removed by the carbon (or chiefly by the manganese), was produced by the oxidation of some of the iron, by the blast of air. This, and the sulphur, and some other impurities, now removed by the manganese, were what made the product red short before recarburization. The steel is now cast into ingots, which are malleable at a high heat.

But Mr. Bessemer's troubles did not end here. The product was still uncertain, though often uniform and excellent. Some subtle impurity was still lurking in some obscure corner—now appearing and now retiring. To find it, Mr. Bessemer put every iron and material employed, through a costly and thorough course of chemical analysis, and so discovered phosphorus to be the arch-enemy. And to this day, irons containing above two hundredths of one per centum of phosphorous cannot be employed to advantage. Experiments to remove or neutralize it are in progress, and greater obstacles than this have been overcome. Mr. Bessemer also determined the amounts of other materials—silicium, sulphur, etc.—that affected his process, and with Mr. Mushet's assistance (satisfactorily acknowledged) has presented to the world, not merely a theory, but a perfected process and adequate machinery, for carrying it out. It will thus be observed, that however greatly the public is indebted to Mr. Bessemer's inventive powers, it owes still more to his indomitable pluck.—*Troy Times.*

BURYING ALIVE—EXPERIMENTS WITH VESTER'S PATENT BURIAL CASE.

The idea of being buried alive is one that fills the mind with horror, and the accounts which have from time to time appeared in the public prints, describing such occurrences, have always attracted the attention of a sensation-loving public. It may safely be assumed, however, that a very large proportion of the stories of the exhumation of bodies which gave signs of having moved in their coffins, are rehashes from old romances, or have their origin in the awkwardness of those who were intrusted with the interment of the remains; the indications of convulsive efforts to escape death; and other sensational details, being purely imaginative. The chances at this age in a civilized community, observing the decent rites of burial, that living bodies should be interred by mistake, is so small, that it is practically unworthy of consideration. In Germany it has long been the practice in many places to deposit the dead in mortuary houses erected for that purpose, until the commencement of decomposition shall have absolutely proved the death of the bodies deposited in them. Our editorial letter from Strasbourg, page 202, vol. XVII, contains the following description of this practice, as we saw it at Frankfort-on-the-Main, and at Munich:

"In a building at the entrance to the cemetery, the bodies are placed upon iron cots in a recumbent or half-sitting posture, and upon the wrists are fastened rings, which connect with wires and alarm bells hung in the adjoining rooms of the watchman. Each cot is numbered to correspond with the number fastened under the bell, so that in case there should be the slightest motion of the body an instant alarm would summon the watch to the spot. In an adjoining room there is a bed carefully prepared, a bath-tub, electric apparatus, and restorative medicines to be employed in cases of resurrection.

"At the time of my visit I counted the bodies of eight infants, and eight adults, all serenely reposing in a profusion of flowers, and watchmen were sitting in solemn silence awaiting the click of the bell. In Frankfort not a single case of resurrection has yet occurred, but at Munich they had a case many years ago; so they say."

At Wentz, the surgeon, during a course of forty-five years, had only one alarm. It occurred from the body of an old man whose abdomen having subsided from the discharge of a large quantity of fluid, allowed the arms to fall lengthwise beside the body.

There are numerous and generally reliable tests for determining whether death has actually occurred previous to the commencement of decay, which are familiar to most people. Granted that in extremely rare cases, it is possible these should fail, it is difficult to perceive how the device of Mr. Vester is an improvement upon the German method. It consists of an ordinary burial case or coffin with a tube at the head, containing a ladder and a cord to enable the resuscitated individual to return to the upper air, provided he has strength to do it, which we think would in most cases be doubtful.

An experiment with this apparatus was made by the inventor on the 1st instant, at Newark, New Jersey, in the presence of a large number of people, and is thus described in the New York *Tribune*:

"At the hour named the inventor made his appearance and laid himself in the coffin, the lid of which was fastened by four screws, two on each side. This coffin was of the ordinary description, with the exception of a wire screen immediately at its head. The coffin was then ornamented with a cross and a quantity of leaves and white flowers, and the whole—man, coffin, cross, and flowers—lowered by straps into the grave. A large box, rather larger than the customary ones, with a hole two feet square at the head, directly over the coffin screen, was then lowered into the grave. Another box, about two feet in width and seven feet high, was placed in an upright position, one end fitting exactly into the square hole in the coffin box. The earth was thrown upon the box, around the upright, and all was ready for the test. In the upright box was a flight of stairs, by which the ascent to the "upper crust" was to be made. One curious individual looked down the upright, and, seeing the inventor wiping the perspiration from his brow, asked if it was "warm down there?" He narrowly escaped being put from the grounds by the excited Germans present. About an hour after the "burial," Mr. Vester pulled himself from his coffin by means of ropes attached to the lower portion of the upright, and ascending to the stairs, again appeared upon the earth. He was greeted with kisses and other manifestations of warm approval by a number of his ardent admirers. The exhibition passed off very successfully. Those who witnessed it are divided in opinion as to the utility of the invention. The inventor proposes to place a sort of alarm upon the upright, that the person interred can attract the attention of parties in case assistance is need, and also intends to place shelves in the upright, within reach of the party buried, on which stimulants may be placed. The invention is claimed to be of inestimable service where parties have been interred while in a trance, as well as to relieve persons of the sorrowful thought that perhaps their friends have been buried alive."

MANUFACTURING, MINING, AND RAILROAD ITEMS.

A FACT OF IMPORTANCE TO TOURISTS.—At this time, when many persons are about to make a European tour, it may be interesting to learn that so great are the facilities of communication between London and Switzerland, that a traveler leaving Charing Cross Station at 8:30 A.M., can arrive at Geneva on the following morning.

ILLINOIS AND ST. LOUIS BRIDGE.—The total cost of the great Illinois and St. Louis Bridge, including structure, land, and approaches, is set down at $4,500.000. The engineer-in-chief estimates that the work will be completed in 1870, or 1871, and that in the last named year the receipts of the bridge will be $1,136,260.

THE CANARSIE RAILROAD.—The Canarsie Railroad Company contemplate an extension of their track northwesterly to Greenpoint; thus having two water fronts, and furnishing facilities for travel from East New York to Greenpoint and the upper part of Manhattan Island.

THE MONCRIEFF GUN-CARRIAGE.—Experiments were conducted last month at Shoeburyness, for the purpose of testing the Moncrieff Gun Carriage, the construction and operation of which were fully described in a late number. The gun mounted was the ordinary 7-inch land service, fired first with 14 lb. powder and 115 lb. shot, and afterward with full battery charge of 22 lb. powder and 115 lb. shot. The result was very successful.

FRENCH RAILROADS.—According to official documents, there are at present in working order in France 9,666 miles of railroad, and it is proposed to have 14,699 miles completed before 1878. The cost of construction per mile is estimated at about $145.000 gold.

SLEEPING CARS FOR EUROPEAN RAILROADS.—An American firm has sent an agent to Europe to negotiate with various railroad companies for the introduction of sleeping cars upon their lines. The firm offers to build the carriages and hand them over to the companies on condition of being permitted so collect extra fares, for the accommodation thus furnished, from such travelers as may avail themselves thereof. The adventure will likely prove a success on the long continental lines.

OUR STREET DEPARTMENT.—The President of the Citizen's Association charges the Street Commissioner, in a lengthy letter, with expending $40,000 per annum for blank books and stationery and $30,000 for repairing roads and avenues contrary to section 38 of the city charter, which provides that no expenditure exceeding $250 shall be made except in pursuance of contracts. There would seem to be a necessity of mending ways in a metaphorical as well as in a literal sense.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the most prominent home and foreign patents.

COMBINED SHEARS AND BOLT AND RIVET CUTTER.—Thomas Smith, California, Mo.—The object of this invention is to furnish a neat and convenient tool for the use of persons who work in sheet metal, blacksmiths.

SELF-ACTING WAGON BRAKE.—Thomas Smith, California, Mo.—In this invention the friction blocks are adjustable in order to accommodate them to to different wheels, and are directly attached to and supported by the springs of the brake, The apparatus is also made adjustable to horses of different sizes.

CULTIVATOR.—D. McNeely and C. J. Cady, Spurgeon, Ind.—This invention has for its object to produce a cultivator which will be convenient and effective for plowing corn, cotton, tobacco, potatoes, and other vegetables, and which can be readily and easily adjusted for shallow or deep plowing, as circumstances may require.

CHURN.—J. W Thompson, Bureau Junction, Ill.—This invention relates to that class of churns in which the dasher has four motions, viz: up, down, right, and left, and consists in effecting such motions by means of a new and greatly simplified device, which can be attached to any churn at a trifling expense, and which is convenient and easy of operation.

HAY FORK.—C. S. Ambruster, Woodstown, N. J.—The object of this invention to provide a neat, cheap, and convenient hay fork, by which the hay can be grasped securely, and firmly held, while being elevated, and can be instantly released when arriving at the place where it is desired to deposit it.

POTATO DIGGER AND SEPARATOR.—Wm. Green, Holly, Mich.—In this invention, a new and improved device is employed for separating the vines from the potatoes, whereby the work is more rapidly and effectually accomplished than in other machines, and in connection with this, a new apparatus is used for adjusting the working parts of the machine, and throwing them into or out of gear.

COMPOSITION FOR ROOFING.—Benjamin Stephens. Wheeling, W. Va.—This invention is an improved composition of matter for roofing which is of such a nature, that it will prevent the paper from cracking, and will form a fire proof and water-proof covering for the building.

SELF-FEEDING ROD MACHINE.—Frank Douglas, Norwich, Conn.—In this invention, the knives which reduce the stick to a round rod, are so arranged that one of them scores directly into the stick, and, at the same time, draws it along and feeds it to the cutter, while the others shave off the corners of the rod and round it to the proper size. A new guide plate is also employed together with a new device for holding the rods when they shall have passed through the guide plate.

FLOUR BOLT.—H. N. Shultz, Sabillasville, Md.—The object of this invention is to provide a simple and inexpensive device which can be used in connection with any form of flour bolt, and applied to the old ones now in use, and by which the bolt can be jarred or subjected to a series of sudden shocks during each revolution, so as thereby to be cleansed and kept free from the accumulation of flour. The device is so arranged that it can be readily adjusted to impart any required degree of violence to the shocks, or to allow the bolt to run smoothly, if desired.

BASE BALL TALLY BOARD.—Thos. L. Canary, Brownsburg, Ind.—This invention relates to the game of base ball, and consists in an arrangement of pins and in the use of colored balls thereon, and in a slate or other equivalent marking surface in combination therewith, whereby the game of the contending sides may be accurately kept, as well as that of each individual player.

MACHINERY FOR TURNING, CROSING, AND FINISHING BARRELS.—Saxton J. Arnold and Amos F. Clark, Raymondsville, N. Y.—This invention relates to improvements in machinery for turning, crosing, and finishing barrels, and consists of a device for holding the barrel in a convenient position for the performance of these operations.

SHUTTLES.—Edward Baggett, Fall River, Mass.—This invention consists in a secondary spring interposed between the spring commonly used, to take the wear off from the shoulder of the spindle, and in constructing the shoulder of the spindle in a form adapted to the application of the said secondary spring.

RAILROAD CHAIRS.—Samuel T. Alexander, Pittsburg, Pa.—This invention consists in a bed plate which is to be fastened to the tie, provided with grooves for seating clamping pieces which support the rail and with lugs for preventing the said clamping pieces from being thrown out of the grooves wherein they rest; and also in the said clamping pieces.

CHECK VALVE FOR PUMPS.—Wm. R. Malone, Mason, W. Va.—This invention consists in providing a hollow tapered seat having a downward projection for supporting the valve stem, which is provided with jam nuts to regulate the amount of lifting of the valve, which is seated upon the top of the valve seat, the latter is arranging to be fitted into a box or cylinder and secured in the well tube at any desired point.

STOVE DRUM.—G. S. Walker, Erie, Pa.—This invention consists of a hollow radiating cylinder or drum made of sheet metal and suitably arranged to be applied to a stove in any desired manner, and having pipe connections for securing and discharging the product of combustion, and provided with an internal apparatus for conveying the said product around and exposing it to the shell of the drum in a manner to extract the heat therefrom.

ADHESIVE PLASTERS.—John Lynch, Columbia, S. C.—This invention consists in attaching to the backs of such plasters one or more springs, stays, or flexible rods or bows, which not only prevent the plaster from crumpling or wrinkling, but serve as additional support to the muscles.

CARRIAGE COUPLING.—Alfred S. Johnson, Waupun, Wis.—This invention relates to an improvement in the method of coupling the thills of buggies or the poles of carriages to the

PUNCH FOR BELTS AND OTHER PURPOSES.—David M. Weston, Boston, Mass.—This invention consists of an improved construction of the jaws of a common hand punch, whereby the distance of the hole to be punched from the edge of the material may be readily gaged, and the material disengaged from the punch after the hole has been formed; also, an improved arrangement of the spring for opening the jaws.

HAND LOOM.—Edwin Lowe, Burrows, Ind.—This invention consists in connecting to the lay, pawls suitably arranged to give intermittent rotary motion to a tappet shaft, which in turn operates the treadles and picker staves.

GATE.—J. H. McKnight, Oakland, Mich.—This invention has for its object to furnish an improved gate, simple in construction, strong, and durable, and which may be conveniently operated to open or close it, without its being necessary to get out of the carriage for that purpose.

ORGAN PIPE.—Geo. H. Brock, Huntington, N. Y.—This invention relates to a new manner of constructing organ pipes, and consists in making each pipe of a curved plate, held between two disks. In this manner a more substantial, solid, effectual, and a cheaper pipe is obtained than could ever be produced according to the old plan now in use.

SEGAR PIPE.—Henry E. Doster, Bethlehem, Pa.—This invention relates to an improved method of smoking tobacco, whereby all the advantages of a fine segar may be enjoyed without incurring the expense, and whereby the objections to the vulgar pipe are obviated.

CHURN.—N. P. Chaney, Potsdam, N. Y.—This invention relates to improvements in churns, the object of which is to provide a churn having beaters provided with air passages to convey the air down into the cream while it is being agitated, and scrapers for scraping the cream off from the underside of the cover, all arranged in such a manner as to scrape it away from around the opening for the shaft, and thereby preventing it from oozing up through the cover around the shaft.

SLEIGH.—Lewis A. Spickler, Clear Spring, Ind.—This invention consists in the location of the point of attachment of the shafts with the sleigh behind the front or bent part of the runners and the metal plate, permitting this improved location of the same.

RAILROAD CAR SEAT.—F. F. Wagner, Harrisburg, Pa.—This invention consists chiefly in attaching projecting lugs to the axles, by which the swinging arms, holding the chair backs, are secured to the seat frame, said lugs being attached to that side of each axle which is opposite to that from which the arms project, so that if the arms are turned down, the lugs will project from above the axle, and will raise the seat on that side on which such arms are folded down.

DISTILLING APPARATUS.—Duby Green, New York city.—This invention relates to a new apparatus for distilling alcohol directly from the mash, and consists in a new construction of the boiling apparatus, which contains six chambers, one above the other, all communicating with each other, and all producing vapors from the mash contained in them; the lowest chambers, which have the weakest mash, receiving the greatest amount of heat, and the highest the least. The invention also consists in the arrangement of a new stirring device, which receives its heat from the vapors that arise from the boiling apparatus, while heretofore direct steam had to be used for that purpose.

VENTILATING SASH OPENER.—W. C. Stickney, and James McGee, Steubenville, Ohio.—This invention has for its especial object to furnish an improved device for opening and closing ventilating sash-doors, or transoms of railroad cars, which shall be simple in construction, easily operated, and which will hold the sash securely in any position to which it may be adjusted.

CIRCULAR SAW CARRIAGE.—John Orm, Paducah, Ky.—This invention has for its object to improve the construction of the carriages of circular sawmills, so as to make them more convenient and effective in operation.

LIFE AND SURF BOATS.—John R. Grace, Brooklyn, N. Y.—This invention has for its object to improve the construction of the improved and surf boat, patented by the same inventor, March 6th, 1860, and numbered 27,362, so as to make it more convenient and safer in use.

VELOCIPEDE.—Andrew Christian, New York city.—This invention has for its object the construction of a velocipede, in such manner that the axle will always be under complete control of the operator, the dead point being readily and completely overcome. The invention consists in so connecting the two operating levers with the connecting rod of the crank, that the dead point of one will readily be overcome by the movement of the other.

WATER WHEEL.—Joseph Hathaway, Woodstock, Vt.—This invention relates to a new and improved water wheel, of that class which is attached to a vertical shaft, and works within a cylindrical case, and has an internal discharge.

CORN PLANTER.—S. O. Campbell, Leavenworth, Kansas.—This invention relates to a new and improved corn planter, which also, when desired, may be readily converted into a cultivator. The invention consists in a novel construction and arrangement of parts whereby corn may be dropped with great accuracy, and properly deposited in the hills; the kernals or grains being left at the desired distance apart, and the device placed under the complete control of the operator or driver.

CHURN DASHER.—A. T. Bleyley, Conception, Mo.—This invention has for its object to furnish an improved churn dasher, which shall be so constructed and arranged as to bring the butter in a very short time, while at the same time it may be used for gathering the butter, and for removing it from the churn.

CHURN.—Joseph Watts, Brazil, Ind.—This invention has for its object to furnish an improved churn, which shall be simple in construction, easily operated, and effective in operation; bringing the butter quickly, developing

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all the butter that may be in the milk, and separating the butter as fast as it is formed from the milk.

DENTAL INSTRUMENTS.—H. T. Fogg, San Paulo, Brazil.—The present invention relates to a new and useful improvement in dental and surgical instruments, which are so constructed with adjustable handles that the dentist or surgeon may carry a number of instruments with him with one set of handles which shall be common to all, thus greatly reducing the weight of metal he would otherwise be obliged to carry.

BALING PRESS.—Dangerfield Dunn, Lewisport, Ky.—This invention relates to a new and improved baling press, of that class in which toggle levers are employed for operating the platen. The invention consists in a peculiar manner of applying the rope to the toggles by which the latter are operated, and in a novel manner of arranging the platen with the toggles, whereby a compact and powerful baling press is obtained, and one which will admit of being used as a beater press when required.

STEAM PRESSURE AND FIRE REGULATOR.—Abraham Kipp, Jr., Sing Sing, N. Y.—This invention relates to a new and improved apparatus or device for regulating the pressure of steam in boilers by automatically controling the fires thereof; and it consists in a means connected with a damper, and communicating with the steam boiler, whereby an excess of steam pressure in the boiler is reduced by the action of the steam from the boiler upon the mechanism employed in such a manner as to partially close the damper and check the draft of the fire, and when the pressure is below the standard required, the mechanism made to open the damper and thereby increase the draft of the fire.

HANGING OR SECURING CIRCULAR SAWS TO THIER SHAFTS.—William McDonald, Calais, Me.—This invention relates to a new and improved mode of hanging or securing circular saws to their shafts, whereby several advantages are obtained over the present or old mode.

SOFA BEDSTEAD.—M. K. Maximilian, New York city.—This invention relates to a new and improved sofa bedstead, and has for its object simplicity of construction, economy in the manufacture, and a general neat appearance of the article.

CHURN.—John Faussauer, Wheeling, Iowa.—This invention relates to a new and improved churn of that class which are provided with vertical rotating dashers and it consists in a novel construction of the dash and means for operating the same.

BROADCAST SEEDING MACHINE.—Joseph Haas, El Paso Ill.—This invention relates to a new and improved machine for sewing seed broadcast, and it consists in a peculiar construction and arrangement of parts, whereby seed may be sown broadcast in a perfect manner.

REAPING AND MOWING MACHINE.—K. H. C. Preston, Manlius, N. Y.—This invention relates to certain new and useful improvements in reaping and mowing machines, and consists, 1st, in a novel and improved arrangement of driving mechanism, whereby spur gearing of moderate dimensions may be used and arranged in a very compact way. The invention consists, 2d, in a wooden strip or connection interposed between the sickle and the crank, and which drives the same for the purpose of ensuring ease of motion, preventing wear and tear and derangement of the working parts connected therewith. The invention consists, 3d, in a novel and improved means for throwing the sickle driving mechanism in and out of gear. The invention consists, 4th, in an improved pivot for the connecting rod, whereby strength and durability are obtained with ease of motion and diminution of friction. The invention consists, finally, in a novel and improved manner of attaching and adjusting the draft fall for the purpose of raising and lowering the points of the fingers or guards, as circumstances may require.

ANIMAL TRAP.—Alexander Campbell, Oxford, Ind.—This invention consists in a platform suspended centrally in respect of its length, or on a pit, but above the center vertically, so that it will return to its normal position by the action of gravitation, and provided with a latch projecting downward from the center of the platform to hold it in position until the animal, approaching the bait near the center of the platform, steps on a hinged plate connected with the latch, disengaging it, when the weight of the animal causes the end of the platform he is on to swing downward, delivering him into the pit.

TOOL FOR CUTTING OR SLITTING THIN BOARDS.—John Langham, Jr., Philadelphia, Pa.—This invention consists of a cutter or knife secured vertically to a hinged holder which is suspended on a sliding stock arranged in ways resting at each end upon suitable supports, which may be secured to a bench so as to maintain the said ways sufficiently above the bench to admit the board to be cut to be passed under the same in front of the cutter, which, being pushed forward by the operator will sever the board. A spring is connected to the stock of the cutter to retract it.

ASBERTOS FELT.—H. W. Johns, New York city.—This invention consists of sheeting composed of asbestos and various kinds of felted and pulped matter. It is designed for roofing and sheathing purposes and provides a cheap and indestructible article for the purpose.

DRAFT EQUALIZING DOUBLE TREE.—George A. Mosher, Champlain, N. Y.—The object of this invention is to enable two horses of unequal strength or energy to be worked together with the best results.

ADVERTISING BULLETIN FRAME.—Wm. P. Brown, Watertown, N. Y.—The object of this invention is to provide a convenient and inexpensive means of publishing a number of business advertisements in the same frame. It consists of a frame constructed with several devices for the convenient insertion or removal of a number of advertisements as the firm styles, nature of business and addresses, and the like, whereby the same can be inserted and displayed permanently in some public place, and so arranged that any one of the said advertisements can be readily removed or substituted by other or different advertisements.

DOOR LOCK.—S. A. Green, Lexington, Ind.—This invention consists in the mechanism of a lock for doors. The key hole in the lock case is dispensed with and the lock rendered difficult to open without the key.

SPOKE TENONING MACHINE.—Calhoun & Collins, West Lebanon, Pa.—This invention is for the purpose of cutting the tenons of wagon-wheel spokes and consists of a simple and effective combination of mechanism for the purpose.

LAMP CHIMNEY CLEANER.—N. A. Vurgason, Brooklyn, N. Y.—The object of this invention is to provide a simple and efficient implement for cleaning the chimneys of kerosene lamps.

VANTILATED HAT.—M. S. Watkins, Mansfield, Texas.—This invention relates to a new and improved method of forming hats whereby the same are better ventilated, and conform more perfectly to, and fit more comfortably on the head of the wearer.

AXE.—J. W. Hilton and R. W. Green, Bradford, Pa.—The object of this invention is to provide an axe with a separate and removable cutting edge whereby the latter may be readily removed when rendered unfit for further use from wear or other cause and a new cutting edge substituted therefor, thus saving the pole or main body of the axe.

BELTING, ETC.—Thomas Standring, Fort Richmond, N. Y.—This invention relates to a new and improved method of constructing belting, or traces, or other straps now made of leather only, or of any one material, whereby the strength of the same is greatly increased.

CONSTURCTION OF SHEET-METAL CANS.—Conrad Seimel, Greenpoint, N.Y.—This invention relates to a new and useful improvement in the construction of sheet-metal cans, designed more especially for holding coal oil or petroleum for export or domestic use. The invention consists in a novel and improved way of constructing the seams of the can whereby great strength is obtained with economy of manufacture.

RAKING DEVICE FOR HARVESTERS.—K. H. C. Preston, Manlius, N. Y.—This invention relates to a new and improved raking device for harvesters, and it consists of a platform constructed in the form of the section of a hollow cone, and using in connection therewith a revolving rake and beaters, constructed, arranged, and operating in such relation with the platform, whereby the cut grain may be automatically raked from the platform by very simple and economical means.

DEVICE FOR DESULPHURIZING ORES.—R. Plummer, Brooklyn, N. Y.—This invention relates to a new and improved device for desulphurizing ores, and it consists in the employment or use of a revolving retort placed in a furnace and communicating with a flue, all being so arranged that the baser metals contained in gold ores may be oxidized and the gold set free so that the latter may be amalgamated and separated from the foreign substances of the ore.

CAST IRON PIERS.—William B. Porter, Plattsmouth, Nebraska.—This invention relates to a new and useful improvement in cast iron piers for bridges, etc., etc., and it consists in casting the same in tubular sections connected together by vertical screw rods strengthened by tubes, the piers being filled with concrete.

CLOTHES WASHING MACHINE.—Joseph Osterhout, Rock Island, Ill.—This invention relates to a new and improved clothes-washing machine of that class in which corrugated rollers are employed in connection with an endless band or apron. The object of this invention is to obtain a washing machine of the kind specified which will not injure or tear the clothes and which will at the same time operate in the most efficient manner.

SULKY PLOW.—A. R. Stanley and Henry W. Ensign, Shullsburgh Wis.—This invention relates to a new and improved plow of that class which are commonly termed "sulky plows." The invention consists in a new and improved means for regulating the depth of the penetration of the plow into the earth so that furrows of greater or less depth may be made if desired, and also in a novel manner of attaching the plow to the carriage and the arrangement of the same, whereby said plow may be liberated or thrown out of the ground, whenever necessary, by a very simple manipulation.

TOOL REVERSING CUTTING MACHINE.—S. D. Tripp, Lynn, Mass.—This invention relates to a new and improved machine for cutting out pure fabrics or stock, various articles which have curved sides, such, for instance, as the soles of boots and shoes, and it consists in having the stock to which the cutters are attached arranged in such a manner that in the operation of the machine, the cutters may be reversed so that reversed curves may be cut consecutively, and also the position of a cutter changed or reversed at each cut so as to admit of economy in stock, the heel of one sole being at side the or the front portion of the adjoining one.

WASHING MACHINE.—Ross and Adamson, Day's Store, Pa.—This invention relates to a new and improved method of constructing washing machines, whereby the clothing to be washed is more conveniently held upon the rubber and is more thoroughly and easily washed. It consists in a jointed clamp or holder attached to the end of an arm by staples so as to form an universal joint, said arm being so connected with a treadle as that the necessary pressure of the clothing upon the rubber in the tub is produced by the foot of the operator pressing upon the same, whereby the washing of clothes is effected without the necessity of the operator putting the hands in o the hot water or suds.

HAME FASTENER.—John Koch and Daniel Seachrist, Columbiaana, O.—This invention is for the purpose of connecting the lower ends of hames and for tightening the same, thus dispensing with the usual buckle and strap, or simple string or thong and supplying instead, a simple, effective, and easily operated device, by means of which harness hames may be drawn upon the collar with the requisite degree of tightness, and fastened securely thereon.

BORING TOOL.—James C. Millerd, River Point, R. I.—The object of this invention is to provide a simple and effective tool for boring out holes in castings and other iron work. It consists in general terms of a pair of steel cutters or boring plates held in a mortise or rectangular eye in the end of a metal shank and arranged at right angles to the axis of the shank, so that the said boring plates will pass in contact with each other when being set out or in by an adjusting screw.

GUNPOWDER—G. A. Numeyer, Altenburg, Germany.—This invention relates to the improvement in the manufacture of powder for fire-arms and blasting purposes, producing an explosive powder more powerful than the ordinary powder now in use.

WAGON AXLE.—G. S. Garth, Mill Hall, Clinton, Pa.—This invention consists of two frictional bands one of which is formed with a dove-tailed annular slot, fitting upon a dove-tailed collar formed on the axle arm at the shoulder of the same. The bands are cast on the axle arm and a reof any suitable antifriction metal as brass composition or babbit metal.

ROTARY PUMPS.—John Poppe, Greenpoint, N. Y.—This invention has for its object to simplify the construction and improve the operation of the improved rotary pump, patented by the same inventor, December 5, 1867 and numbered 71,786.

HAND MILL.—Edwin Alsop, New York city.—This invention has for its object to furnish a simple, convenient and effective hand mill which shall be so constructed and arranged that it may be used for grinding coffee, spices, grain, seeds, dye stuffs, oil and water colors, etc., and which shall not be liable to break or get out of order.

HAND SPRING FRAMES.—J. W. Burkhart, Cameron, Mo.—This invention consists in an arrangement of the spindle upon a vibrating arm pivoted to the frame of the machine at one end, and borne upon the upper end of a vibrating lever whose lower end is also pivoted to the frame, and is arranged to be adjusted with reference to the spindle arm, so as to elevate or depress the spindle, and for the purpose of tightening the belt; and it also consists in providing a double grooved pulley on an adjustable support, over which the belt from the main driving wheel passes to the multiplying wheel in such a manner that the belt in crossing itself will not wear, and so that it may be adjusted toward or from the driving wheel, also for tightening the first belt.

NEW PUBLICATIONS.

ELEMENTS OF NATURAL PHILOSOPHY. A Book for Beginners, by W. J. Rolfe and J. A. Gillet. Boston: Woodworth, Ainsworth & Co.

The above is the title of a work which, so far as general style of publication and beautiful illustration are concerned, is adapted to the purpose for which it was written. It has, however, important defects. The subject of electricity is not touched upon, notwithstanding its great importance, while the subject of sound, of less practical utility, is extended to considerable length. We notice some errors in definition also; for instance, the common balance is described on page 5 as a bar turning upon a pivot in its center, etc. The accompanying engraving represents it in the same faulty manner. In the appendix the subjects of the origin, transmutation, and conservation of force are discussed, which if not intended for the same class of pupils as the rest of the work, would have been better omitted, or the space it occupies used to supply the deficiences of other parts of the work. If intended for beginners, we submit that it is not a subject fitted for them, even after they have acquired the limited knowledge of physical forces they are likely to obtain from a study of the former portions of the work. Other features of the book, especially its use of the French system of weights and measures, we can commend, and notwithstanding the criticisms we have felt it our duty to make, we think it is perhaps as nearly perfect as most books of a similar character.

AMERICAN WATCHMAKER AND JEWELER. By J. Parish Steele. New York: Jesse Haney & Co., 119 Nassau st. Price 25 cents.

This is a convenient pocket manual, one of a series which Mr. Haney is publishing under the title of "Trade Manuals. It contains many receipts, and directions for doing work, the value of which will be better estimated and appreciated by practical watch and clock makers than by us. We commend this little manual to our readers who are interested in the subject on which it treats.

THE WINE-MAKER'S MANUAL. By Charles Reemelin, author of the Vine-Dresser's Manual. Cincinnati: Robert Clarke & Co., No. 65 West Fourth street.

A small but complete and thoroughly practical work, containing full instructions for the manufacture of all domestic wines, whether from grapes or other fruits; also directions for the manufacture of cider, with full directions how to bottle and keep both wines and cider, how to manufacture imitation champagne, etc. Price $1.25. Some remarks on the manufacture of cider extracted from this work will be found in a future number.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

W. L.—All persons who travel about to sell patent rights must obtain a Revenue License.

E. H. L., of N. Y.—When a telegraphic cable is broken earth currents are formed each way from the break. The resistance of the entire cable being known, the resistance of the two portions gives the data for calculating the position of the break. A more minute description than this, or an explanation of the methods for telegraphing in opposite directions over the same wire would necessitate the use of diagrams, and occupy much space.

T. V. J., of Mass.—The diamond cuts the glass. No electrical agency is concerned in it so far as has ever yet been shown. Many, have believed however that there is a molecular change produced in the glass under the action of the diamond which makes a fissure deeper than the cutting edge of the crystal penetrates. This however has never been proved.

S. M., of N. J.—According to Bourne, the superheating surface usually given in marine engines is too large. This accords with our own experience and observation.

A. J., of Del.—We believe the first iron vessel ever constructed was a boat of 32 tuns burthen, built by John Wilkinson of Broseley in Shropshire, England, to be used on the Severn River in 1787.

R. T., of Vt.—The so-called mosaic mixture is made of equal parts of tin, bismuth, and mercury. It is used for various ornamental purposes.

R. S., of Ill.—The hemp, (cannabis Indica) from which hasheesh is obtained, is supposed by many to be a variety of the common hemp, the properties of the plant being modified by growth in tropical climates.

A. R. B., of Mo.—The rails in steam railways have a convex upper surface to adapt them to the shape of the car wheels. The shape of the carwheels is such that in running around curves, the outer wheel runs on a larger circumference, and the inner one on a smaller circumference, thus preventing the wheels which are fixed to the axle from scraping. The wheels are fixed to the axle for convenience in oiling, and also that the oil may be retained over the bearing and thus prevent heating between stations. The latter could not well be done did the wheel turn on the axle. Thus you see your friend is at least partially right, in his statement that the shape of the rail is to be referred primarily to the necessity of keeping oil over the bearings.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Asahel Wheeler's siccohast has peculiar merits not possessed by any other dryer for paints. Its powers are at least three-fold greater. It is perfectly neutral, causes raw linseed oil to dry quicker, harder, and with more gloss than boiled oil, and yet retains its natural elasticity, and resists the forces of the elements much longer.

Wanted—a party to furnish checkers from a hard, smooth composition. Address "Checker," care E. H. Bennet, 57 Cedar st.

Wanted—address of all parties who furnish patented household small wares to the trade. Box 1901, Boston, Mass.

For sale—a new engine, 16x24, just finished. For full description address Albertson & Douglass, New London, Conn.

Wanted—a machine for making chalk or fishing lines. Address box 2064, New York Postoffice.

Cal.—Broughton's graduating lubricators, oil cups, and gage cocks are to be had of O'Connor Bros., San Francisco, and Gillig, Mott & Co., Sacramento.

The Ready Roofing Co., by mistake, was advertised as being at No. 1, Maiden Lane. The correct address is No. 81 Maiden Lane.

Horse hay forks, etc. Send circular to Wm. Louden, Fairfield, Iowa.

S. C. Sumner's pat. stencil frame, with movable letters, 7 Water st., Boston. A grand thing for marking any name needed on boxes, bbls. etc.

Peck's patent drop press. For circulars, address the sole manufacturers, Milo Peck & Co., New Haven, Conn.

To inventors.—I will furnish means to patent some useful invention, or will take an interest in a patent, if sufficient inducements are offered. Address, with stamp, J. K. Ross, Noblesville, Ind.

The toy Boomerang.—See Advertisement.

A foreman for a machine shop wanted,—one who has some experience in the business and can bring good recommendations. Address D. A. Brown & Co., Fisherville, N. H.

Wanted—a master mechanic capable of superintending a locomotive and machine shop. One thoroughly accustomed to managing men required. Address box 116 New York postoffice.

For State and County rights to the best and cheapest sorghum stripper now in use, address C. P. Hale, Calhoun, Ky. Agents wanted.

For descriptive circular of the best grate bar in use, address Hutchinson & Laurence, No. 8 Dey st., New York.

Spring-bed bottom—unequalled for simplicity, cheapness, and durability. Manufacturers wanted as agents. Address S. C. Jennings, Wautoma, Wis.

N. C. Stiles' pat. punching and drop presses, Middletown, Ct.

For sale—the whole or a part of a paper mill, all new machinery. For particulars address L. A. Beardsley, Fredericksburg, Va.

For sale—the patent right, in Great Britain, for perforated saws. The manufacture of these saws is now firmly established in the United States, and they are rapidly taking the place of all other solid saws Apply to J. E. Emerson, Trenton, N. J.

Prang's American chromos for sale at all respectable art stores. Catalogues mailed free by L. Prang & Co., Boston.

For breech-loading shot guns, address C. Parker, Meriden, Ct.

Wanted—a second-hand steam hammer. Norway Manufacturing Company, Wheeling, W. Va.

Winans' anti-incrustation powder, 11 Wall st., N. Y. 20,000 references. No foaming. No injury. 12 years in use. Imitations plenty.

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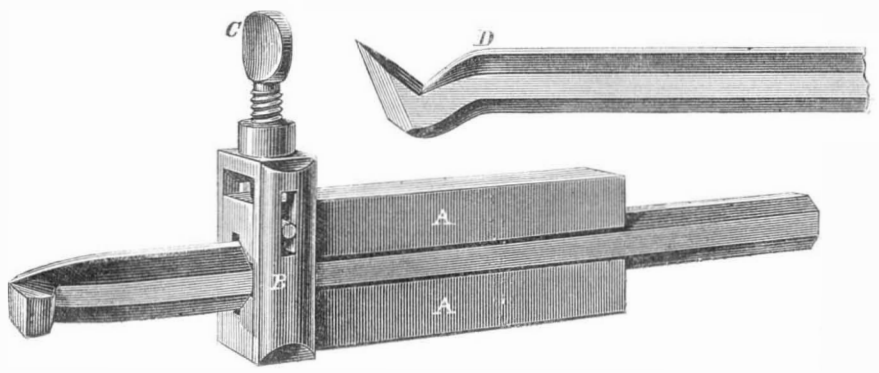
Improvement in Method of Holding Lathe Tools.

The springing of turning and planing tools, when turning out a hole or cutting a deep nut, or on the planer when reaching down to plane a surface much below the face of the work, is a great annoyance to machinists. Sometimes, however slight the chip removed—even in finishing or smoothing—no amount of skill or delicate feeding can prevent the tool from leaving "chatter" marks.

The engravings represent a contrivance designed to remove this difficulty by providing a stay, or, rather, two stays or holders, embracing front and rear, or top and bottom of the tool shank. The holders, A, pass through the slot in the tool post, the lower one being fast to the jaws, B, and the upper one moving freely, held only by a pivot pin moving in slots in the jaw to accommodate itself to the size of the tool shank, and secured on the shank of the tool by the thumb or set screw, C. The tool shown in the holder is an ordinary squaring-up or side tool, and the one shown at D is a common diamond point. In this case the tools, are made from octagonal steel, but the ordinary rectangular tool steel can be equally adapted to the tool holder.



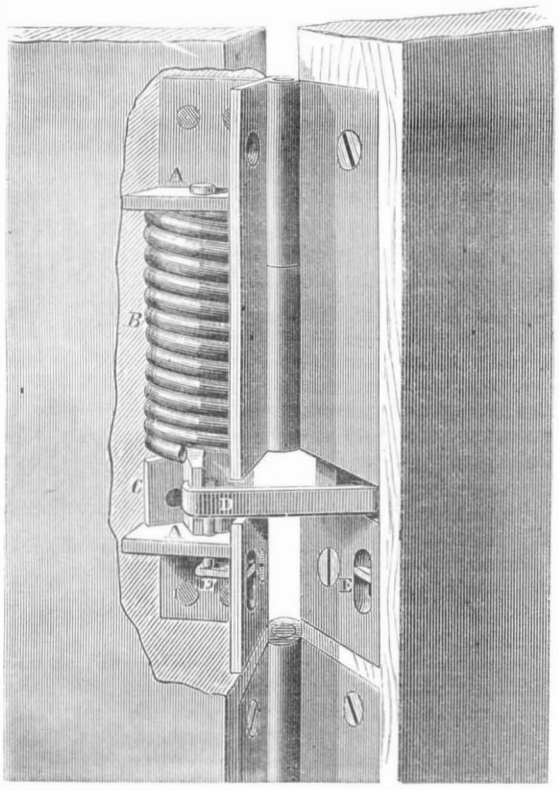
BAILLIE'S PATENT TOOL HOLDER.

Patented Feb. 25, 1868, by John Baillie, Salem, Ohio. The patentee wishes to dispose of the whole right.

STIMSON'S PATENT BUTT HINGE DOOR SPRING.

The closing of doors is one of the neglected duties of careless humanity, causing annoyance and provoking profanity. Some door springs, intended to prevent this annoyance, are neither reliable, permanent, nor certain in their operation. That represented in the engraving appears to be free from these defects.

The spring butt, or the hinge that contains the spring, is cast with two leaves instead of one, as is the ordinary butt hinge, one mortised into the edge and the other into the back of the door. Between these two leaves are two transverse connections, A, which serve as supports to a spiral spring, B, and as bearings for the axles of a corrugated plug passing through its center. This plug has at its bottom several vertical flanges, C, upon which the spiral spring rests and against one of which the bottom end of its wire bears. Holes in these flanges by a suitable wrench permit the winding up or turning of the spring to increase its tension. A hooked strap, D, engages with one of the flanges on each spring and connects the two. The operation is to employ the torsion or twisting of the spring rather than its longitudinal elasticity. The effect is to allow the greatest force to its action when the door is nearly closed, just where most door springs fail; they usually exerting their greatest power when the door is wide open, and their least when it is closed. In swinging a door wide open, with this spring the tension on the spring amounts only to one-fourth a revolution, so there is slight danger of its breaking by being overstrained.



If at any time the use of the spring is undesirable and the door is to be free, the slipping up of catches, E, will engage them with the flanges, C, and prevent the rotation of the spring. The strap or connection, D, can then be removed, or one end unhooked and placed in one of the interspaces between the flanges when, while the door may be opened wide, it cannot be closed, being held either at right angles with the wall or half way between, as may be desired. This is a great convenience in hot weather. Patented by Enos Stimson, of Montpelier, Vt., November 19, 1867. The New England Butt Co., Providence, R. I., are manufacturing the improved butts and are prepared to fill orders.

A BLIND INVENTOR.

An interesting biography of James Gale has just appeared in England. Mr. Gale "was blind from his youth up." Yet, notwithstanding this apparently insurmountable obstacle to mechanical success, he has achieved even fame by his inven tions. Mr. Gale was not educated in a school for the blind, nor by the methods usually adopted with this unfortunate class of youth. Instruction was imparted to him by dictation, a method which, by its evident success in this case, would seem to be worthy the attention of instructors. He was thus taught reading, arithmetic (of course substituting the sense of touch for that of sight), and even what would seem more difficult, writing. Few blind people, who have arrived at any distinction, have been educated in any other schools except those specially instituted for the blind; and it is stated that very few indeed of those so educated are able to support themselves by their own labor.

Mr. Gale early showed that the loss of sight would not render him a useless member of society. His senses of hearing and of touch were so remarkably acute as to almost enable him to conceal the fact that he was blind. Indeed, it is related of him, that once, while riding in a carrier's van from Plymouth to Tavistock, the driver lost his way, and was guided by him into the right road by the sense of hearing alone. He has several times acted as a guide to strangers, effectually concealing his blindness until he had reached the end of his journey. More astonishing feats are related of this remarkable man. He has ridden a horserace and won it. He has ridden a blind horse for miles in safety, and has shot pigeons at a match, his aim being guided by his delicate hearing.

In 1864 he singularly enough commenced experiments with gunpowder. In one year he had made the discovery that this substance could be handled and transported in safety when mixed with fine glass, which may or may not have been the hint which led to the subsequent discovery of dynamite. He has since invented an ammunition slide, and a rudder ball cartridge, by which, it is stated, great rapidity in firing can be obtained. Another invention of his is the "fog shell," designed to be projected upon the decks of vessels, and to generate a dense, blinding vapor, which would seriously embarrass them in an engagement. Another invention is what he calls a balloon shell, which is said to clear a space having a diameter of a hundred feet, from all but the most ponderous objects, at a single explosion.

The lesson taught by the life of such a man ought to put to the blush those who so easily succumb to obstacles far less formidable than he has had to encounter. The very nature of his experiments upon a material seemingly so dangerous to one deprived of sight, shows his courage and the strength of his character.

He is a good business man, and a lover of his race. Sympathizing with those who are, like him, destitute of sight, he founded the South Devon and Cornwall Institute, for the blind, which will stand as a monument of a mind that soared above obstacles, and a heart unembittered by the cruelest of all deprivations.

The Soda Lakes of Mexico.

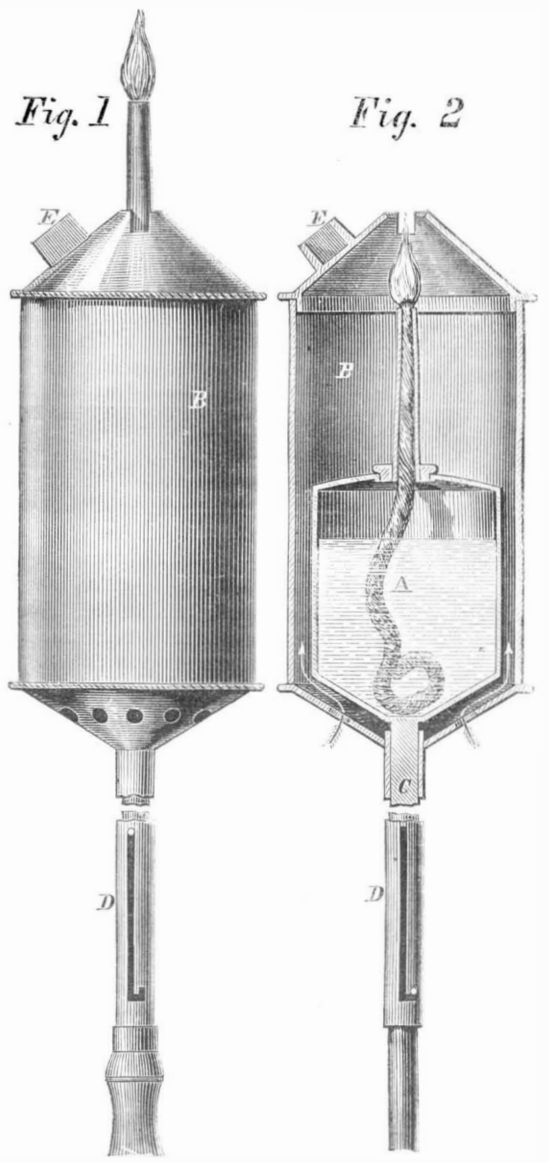
The soda lakes of Mexico, from the waters of which crude soda is largely manufactured, are among the natural sources of wealth to that country. The lake of Tescoco, a short distance from the capital of Mexico, and communicating with the city by means of a canal, is one of the greatest natural curiosities of that country. In the center is a barren island, with a hill composed of volcanic rock, and known as El Penon de los Bancos, or rock of the baths, rising from the surface. This desolate spot is famous for the manufacture of crude soda, or tequesquite, a manufacture not more remarkable for its primitive method than its vast resources. The earth of the valley adjoining the lake is impregnated with a species of soda, and Lake Tescoco itself is a concentrated solution of soda. It contains an immense amount of the salts of sodium, chiefly the chloride of sodium and the carbonate of soda. The lake has great surface and small depth, and with a rainy season of four months and a dry season of eight, its range of expansion and contraction is 220 square miles at its maximum to 80 square miles at its minimum. A calculation of the contents of the lake was made in 1851, when the lake was considerably contracted, and the proportion of solid matter was ascertained to be not less than 18 per cent. The Penon soda stills are not numerous, but illustrate the rude principle at work all around the lake. They are simply mounds of accumulated dark, bluish mold, on which large round holes are made here and there. In these holes bags are placed, and in the bag the impregnated, frosty-looking earth found every morning along the lake. Over this earth water is poured, and the liquor which sinks through the dirt, and is drained from the bag, passes into a vessel below. The solution thus caught is evaporated over a fire, and tequesquite is the result. This is the whole process, which is the same that was used in the days of Montezuma. With this primitive system of manufacture, the lake, according to the estimates of the School of Mining in the city of Mexico, produces annually 1,680,000 pounds of crystallized or pure soda, and 3,696,000 pounds of tequesquite or impure soda.

Styptic Paper.

The styptic properties of perchloride of iron are well known, but in many cases it is inconvenient to carry about and to apply in case of need. A method of preparing paper with this substance, so that it can be carried safely in the pocket, at the same time preserving the styptic quality has been invented in Paris. The paper is first dipped in a solution made of one pound of gum benzoin of the first quality, one pound of rock alum and four and one-third gallons of water. This mixture is heated in a vessel, carefully tinned inside, up to the boiling point; and the solution is to be kept boiling for four hours, and skimmed from time to time. The water evaporated is to be replaced by the same quantity of fresh water, and, as soon as the solution is cooled, it is to be filtered off. The paper or tissue is then dipped into it, and to be kept there until sufficiently saturated; it is then to be carefully dried. When dry, a solution of the perchloride, in a more or less concentrated state, is applied by a brush or roller. The paper or tissue thus prepared is folded up and preserved from the action of the air by wrapping it in a piece of waterproof taffeta, prepared with the addition of resinous substances, and in this manner it can be preserved any length of time always ready for use. Its application to small wounds will stop the bleeding almost instantly.

PATENT TORCH FOR LAMP-LIGHTING.

The object of the device herewith illustrated is to diminish the labor and time of lighting street, hall, or depot lamps, when beyond the reach of the hand, obviating the necessity for the use of a ladder and preventing the extinguishment of the light by gusts of wind. Its construction is simple. The lamp proper, A, Fig. 2, is contained within a case, B, and af fixed to a rod, C, which forms a portion of the handle, that may be of any length desired. The case is sustained on a metal tube, D, in which the handle, C, slides, the distance of its movement being governed by a slot in the tube and a pin on the handle. The object is to withdraw the flame of the lamp within the case as the operator passes from one lamp to another, to prevent the flame from being blown out. To insure continued combustion the lower part of the case is pierced with holes to admit air, as seen in Fig. 2, which also shows the lamp drawn into the case. The snug, E, is a wrench for opening the gas cocks and a slot across the top of the case is for a similar purpose. From the foregoing description a sufficiently clear idea of the device and its use may be obtained.



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HIPPOPHAGY.

The *New York Medical Journal*, for August contains a long article which takes strong ground in favor of the introduction of hippophagy among the civilized races of Europe and America. The name, which is probably supposed to confer dignity upon the subject, means the practice of eating horseflesh. The first argument adduced in its favor is the humanity of the practice. The poor old skeletons of horses, which are seen dragging themselves and fish, fruit, or oyster wagons through our suburban streets, and the poor women who painfully labor, early and late, seem to have been specially made to supply each others necessities, and to mutually alleviate each others' woes. The latter by eating, and the former by being eaten, will thus fulfill the end which kind Providence foreordained for them, and which nothing but silly prejudice and religious bigotry have hitherto prevented. It is not pretended that anything but *old* horses can be afforded for food, and it is only such that it would be humane to eat. It is urged, that in refusing to eat horseflesh, the civilized races are an exception to the rest of mankind. We freely acknowledge that the civilized races do not eat many things that are considered excellent diet in many parts of the world. Rats, dogs, insects, and the bodies of men themselves are to be found upon the well-furnished tables of people in various parts of the globe. Neither are such people so nice in their distinctions about the parts of animals which are fit to be eaten, as their more civilized brethren. They avoid the extraordinary waste of food attendant upon the practice of dressing the bodies of animals in vogue among us. It is with feelings of envy that we read of an African native devouring the warm, raw entrails of recently slaughtered beeves, and we are almost inclined to urge upon the soft-hearted hippophagist who so ably sets forth his views in the *New York Medical Journal*, that it would be a good thing to call the attention of poor women to this cheap (and save for vulgar prejudice) good, wholesome, and even palatable diet.

It is stated that the advent of Christianity put an end to the use of horseflesh as food in ancient Germany, and in other parts of the world, where it had been in use among the pagans for "sacred feasts, and for pagan altars;" and that it was the love of Christianity that put a stop to the practice in Iceland. We feel sorry that Christianity, which we have been hitherto disposed to regard as the great regenerating element in this otherwise benighted world, should have so afflicted old horses, depriving them of the blessing of being knocked on the head as soon as their strength began to decline, to reappear upon the tables of the poor in all the different forms of roast, and boiled, and hashed, and warmed over, which it is so delightful and appetizing to think of. It is within the limits of reason to suppose that colts, sometimes deformed from birth, might be killed, at an early period of life, when their flesh would be almost equal to veal, and the suffering poor might then be admitted to the luxury of colts foot jellies, and cutlets. Boiled colt's head seems a good dish for the poor, and the broth would be of service in case of sickness.

The Cossacks eat horse, and even drink the blood of the animal. If they can do this, the custom is, of course to be recommended to the civilized poor, and doubtless a good drink of horse blood would enable many a miserable seamstress to accomplish one shirt per diem more than she could without, and it would certainly be better than the blood of "John Barleycorn," which is now too often indulged in, and is also more expensive.

It is admitted, that its taste is peculiar, and that it is apt to be tough; but then the appetites of the poorer classes are known to be excellent, and their teeth are generally good because they don't eat many sweetmeats. So these objections are of no account.

The horse is subject to glanders, which is communicable to man, and is a most horrible, loathsome, and fatal disease. To this, it is answered, upon the authority of one Rayer, who is said to have experimented upon the meat of horses which had the disease, that it is not communicable after the flesh is boiled. Now what poor woman can be so blinded by prejudice as to refuse horseflesh after that. It reminds us of the old lady who advised her son to always eat his chestnuts "biled," because "*biled worms* were never known to hurt anybody." Who knows but glanders and poll evil may not yet be discovered by some savant to impart rich and peculiar flavors to the flesh of old horses; or that soup, made from the spavined shinbones of these animals, may not prove a specific for the scrofulous taints engendered by filth and darkness.

Surely the civilized world ought to hail the resumption of hippophagy, and erect monuments to the humane individuals who have been instrumental in reviving the practice. We think it would be well, also, to give some attention to cats and dogs. They are easily raised, and can also be killed at an age when their lives have become a burden, and would no doubt furnish good food for paupers. The Government should immediately provide for the supply of such meat to the prisons and almshouses, and it might not be inexpedient to serve it out in rations to the army and navy; thus lessening the public expenditures and aiding in the payment of the national debt. Let us hope, friends of humanity! A new era is dawning. Let not our prejudices obstruct its advent.

THE PROGRESS OF CHEMICAL SCIENCE.

Until a very recent period the science of chemistry was made up almost exclusively of facts. The classified results of elaborate and accurate experiments; the relations which exist between the elements of matter and the properties not only of the elements themselves, but of the complex substances formed by their combination; the effects of the physical forces upon combination generalized and reduced to a system, so far as the knowledge of these subjects would admit, constituted the text of the able and numerous treatises that had been written upon the subject. The science has begun to assume a new aspect. The speculative minds have been engaged in framing hypotheses to account for the manifestations of the laws which govern combination. Not content with this they have extended their speculations to the nature of matter itself, and theories which embrace the ultimate form and condition of matter, as well as the forms recognized or recognizable by the senses, are boldly put forth and stoutly maintained.

The objection to such speculations is that no important purpose is subserved by them, while their tendency is to complicate nomenclature and occupy the minds of men with theories which assume to account for facts rather than with investigation and study of facts themselves. It is not sufficient for the establishment of an hypothesis that it accounts for a fact. Because a man might ride in railroad cars from New York to Philadelphia it is not to be inferred that he did ride by that conveyance. There is the possibility that he rode in his carriage or took passage by water. Speculating as to how he made the passage would amount to nothing toward ascertaining the fact, except to guide research into the channel of possibilities.

Now if speculation in physical science were confined simply to indicating the possibilities in the discovery of new facts, we should not say a word against it. That is its true sphere. But when it passes that limit and usurps the place of fact itself it is to be deprecated.

The aim of the modern speculations in the science of chemistry seems to be the demonstration of matter as it exists in its ultimate condition. If this were possible, and a knowledge of matter in that state could be of any service, there would be no objection to them. The old atomic theory never was fully accepted by physicists, and was only accepted at all as an hypothesis, which accounted for certain facts in chemical combination. It was never of any real value, never aided in any important discovery, and we are confident that as it has had its day so the new and more ambitious hypotheses will have theirs. We even doubt that many of these will satisfy the minds of thinkers as well as that did.

The chemist never deals with matter in its ultimate condition. It is with masses that he as well as all others must be content to experiment. The laws which matter obeys in its combinations he may discover, but the essential nature of matter itself is not physical study; it is metaphysical, and it is an *ignis fatuus* that will ever elude pursuit.

The atomechanics of Hinrichs, the rational cosmology of Hickok, and the speculations of Sir Benjamin Brodie, are all to be classed in the category of speculative philosophy. They are attempts to get back of matter into a field which the human mind ean never explore, and like all such speculations we believe them calculated to obstruct progress rather than to confer any solid benefit upon science.

NITROUS OXIDE AS AN ANESTHETIC.

The great blessings which have resulted from the use of anesthetics can not be over-estimated. Those who have never witnessed a severe surgical operation, unaccompanied by their administration, and also contrasted it with one in which their valuable aid was resorted to, must utterly fail to realize the amount of suffering which has been spared the afflicted by these agents. Previous to their introduction nothing could be more horrible, to one not steeled by long practice, than a capital operation. The most agonizing tears and shrieks were wrung from the stoutest and bravest men, while the vain struggles and cries of children, helpless in the arms of powerful assistants, or strapped to the operating table, rendered fainting, which often resulted from sheer pain, a blessed relief. Those who are unconversant with the art of surgery, generally suppose that the amputation of a limb is one of the severest of operations. Having read of the bravery of men who could sit and smoke a cigar during an amputation, they fancy that such manifestations as we have described are to be attributed to weakness of resolution, to an enfeebled and shattered nervous system. But every surgeon knows better. There are operations that are as much more terrible than amputation of the leg, as that operation is more terrible than the extraction of a tooth; many of which are only rendered possible by the use of anesthetics. Operations that were once the dread of the surgeon, as well as the patient, in which the deviation of a hair's breadth, in the direction of the knife, might invade vital parts, requiring perfect steadiness, both in the operator and the subject, are now successfully performed, the patient quietly sleeping during the otherwise long minutes of anguish, the very shock of which formerly often caused death.

Notwithstanding all that we have said, the use of anesthetics is attended with some risks, and it is just that the public at large should know this fact and fully appreciate it. More especially is it important, that the different substances used for this purpose, and their peculiar merits and demerits should be well understood.

In the use of chloroform, most of the deaths which have occurred have been in brief and minor operations. As a result of this fact, there seems to be an increased tendency to substitute the protoxide of nitrogen (laughing gas) in such operations. It has the advantage of being more rapid in its action, its effects cease sooner, and no nausea or depression result from it, unless the gas should be improperly prepared. Experiments have satisfactorily shown, however, that this agent cannot be used successfully for long and tedious operations—that its action is very irregular—that neither in its chemical constitution or its physiological action does it much, if at all, resemble the true anesthetics; for, while with them, though every other element may be excluded, carbon must always be present, and the condition of the blood, heart, lungs, and other viscera, after death from it, is dissimilar from the condition after death from them. These objections are quite sufficient, without taking into account the many inconveniences of its preparation, preservation, and transportation, to prevent its ever being employed in the actual practice of surgery. Caution is needed, both in its manufacture and administration, as by carelessness the noxious deutoxide of nitrogen may easily be generated, and if the gas is not properly tested, and its impurities carefully removed, serious results may follow.

Mr. Colton, who is now in London, produces an autograph scroll of twenty-seven thousand persons who have inhaled the gas in America for extraction of teeth and for minor surgical operations, with the most satisfactory results; pain having been annihilated, and the unconsciousness having passed away within one or two minutes, leaving only agreeable recollections. Some of the entries on the scroll are amusingly characteristic. Many of the patients "have had a high old time;" some "would have teeth pulled that way all day long." Here and there comes a bit of poetry, effusive and grateful, but not destined to immortality. Curter entries of "delightful dreams" are abundant. One gentleman, who came six thousand miles, thinks the journey not too long for the result.

It has, notwithstanding, its rivals. The chloride of carbon, the chloride of olefiant gas, and the bromide of ethyl have been proved to be safe, pleasant, and efficient anesthetics. Even the common coal gas has been stated to be a useful anesthetic, and one which, in an emergency, might be used to advantage. Though chloroform and ether still remain as much in favor as ever for capital operations, for dentists' use and minor operations the above mentioned anesthetics are becoming quite popular, as substitutes for laughing gas.

"SMALL POTATOES."

There has been a tendency in all ages, and among a races of men, to attach to certain expressions a pregnant meaning, differing entirely from the literal signification of the phrase, but which, in its figurative or "slang" sense, is exceedingly forcible. The expression, "It will do to tie to," grew out of the practice of fastening horses to small trees in unsettled portions of the country, and it has come to be applied to individuals as expressing all those qualities of honor, truth, and stability, which render men worthy of confidence. In the same way has the expression "small potatoes come to mean defective morals, want of talent, and general instability of character.

The world is full of grumblers, who declaim against the fickleness of fortune, the favoritism shown in the advancement of men to places of honor and profit, the neglect of merit, and the injustice of Providence. Envious of the so-called good luck of others, instead of setting themselves steadily and persistently to bettering their condition, they cultivate a morbid feeling of disgust at their lot and their work, and become mere time-servers. In other words, they are, and will always remain, small potatoes, of the meanest sort. Grumbling of this kind is one of the principal characteristics of the human small potato. A man may possess mind, education, and other qualifications for high station, but if he does not possess his soul in patience, and do what his hands find to do with his might, biding quietly the time and opportunity for improving his condition, he is small potatoes notwithstanding. When the basket is shaken—as it is sure to be—no matter how many smaller potatoes may have obscured his merit, it will finally be discovered, and if really great, it will be all the more prized, because it has lain so long unnoticed.

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The qualifications for high and responsible positions are as various as the positions themselves; and a man may often possess brilliant talents, and yet lack some apparently minor but all essential endowment or acquirement without which a particular place must be forever inaccessible to him. It may be accuracy, it may be a reputation for probity, tried and tested by service in other subordinate but responsible positions, or judgment matured by experience; whatever it is it must be acquired before he can reasonably expect corresponding promotion. If a young man feels that he possesses the necessary ability for success in learned professions, yet lacks the courage to endure the self-denial which is usually to be expected at the outset of a career in any of them, he is small potatoes, and will probably go through life with the feeling that he might have made some noise in the world had not cruel destiny been so unfavorable to his youthful aspirations. So if a young man lacks courage to live within his income, and allows himself to become a slave to debt, he is small potatoes, and the chances are much against his ever being anything else. As a straw at the source of a river may change its current, so a single act at the outset of business life may direct its entire course. Only the greatest minds can reclaim a misdirected life, and secure success in spite of the lost opportunities, and accumulated difficulties resulting from it.

We do not believe that men often fail to reach their proper level; and it is fair to infer, that, when a person is found at mature years occupying a very inferior position, that there was something about him that made him small potatoes. The exceptions to this, if there are any, only prove the rule; and it may be said to be as certain as any principle in business can be, that, in any profession, good ability, close application, and patient courageous effort, during the day of small things, will ultimately be rewarded by success.

IMPROVEMENT IN WATER WHEELS.

It is rare that it falls to our lot to notice a patent so simple and so obviously useful that it can be fully described without engravings. In this case, however, we are enabled to do this, as the improvement does not relate to the general structure of water wheels, but only to the prevention of the oxidization of iron wheels, without reference to their form, and also to the reduction of the friction of the water upon the working parts of such wheels. The improvement is the invention of Mr. James P. Collins, of Troy, N. Y., and consists in enameling all portions of any water wheel exposed to the action or force of the water with some suitable material, or combination of materials, thereby giving a smooth and glazed surface, over which the water flows with greatly diminished friction, of course adding proportionally to the efficiency of the wheel. It is obvious, also, that all chemical action of the water must be entirely prevented by such a coating. The patent upon this improvement does not limit the inventor to any particular silicious substance or combination of substances, and he is at liberty to use any materials for the purpose above described that he may find upon experiment to be useful. The inventor does not intend to confine the application of this improvement to the wheels of his own manufacture, but will dispose of rights to manufacturers of water wheels throughout the United States. All applications should be made to J. P. Collins, Troy, N. Y.

The New English Ironclad.

The shipwrights at Chatham dockyard, England, commenced laying the blocks and ways for the new armor-clad turret ship *Glatton*. An exchange says,

"The drawings and plans received at Chatham dockyard from the Admiralty, show the *Glatton* to be a vessel of 2700 tuns burden, with a length of 245 feet, and a breadth of beam of 49 feet. It is, however, in her armor plating that she will surpass in defensive powers every ship yet constructed; it being intended to plate her with armor 12 inches in thickness along her most exposed parts, while on her turrets the *Glatton* will carry armor 14 inches in thickness, laid on a 10-inch backing of teak, with the usual inner "skin" plating. Unlike the *Monarch*—the deck of which is encumbered with a topgallant forecastle—the single turret of the *Glatton* can be directed towards every point of the compass. Her offensive will, at the same time, be on a par with her defensive powers, it being intended to arm her with a couple of 25-tun guns—the most formidable armament yet given to a vessel of war.

What Breaks Down Young Men.

It is a commonly received notion that hard study is the unhealthy element of college life. But from tables of the mortality of Harvard University, collected by Professor Pierce from the last triennial catalogue, it is clearly demonstrated that the excess of deaths for the first ten years after graduation is found in that portion of each class inferior in scholarship. Every one who has seen the curriculum knows that where Æschylus and political economy injures one, late hours and rum punches use up a dozen; and that the two little fingers are heavier than the loins of Euclid. Dissipation is a swift and sure destroyer, and every young man who follows it is, as the early flower, exposed to untimely frost. Those who have been inveigled in the path of vice are named "Legion," for they are many—enough to convince every novitiate that he has no security that he shall escape a similar fate. A few hours of sleep each night, high living, and plenty of "smashes," make war upon every function of the human body. The brains, the heart, the lungs, the liver, the spine, the limbs, the bones, the flesh, every part and faculty, are overtasked, worn, and weakened, by the terrific energy of passion loosed from restraint, until, like a dilapidated mansion, the "earthly house of this tabernacle" falls into ruinous decay. Fast young man, right about!

Singular Optical Effect of Certain Sounds.

A correspondent from Michigan writes, that whenever he hears sounds of a certain bell in his neighborhood, he experiences a sensation of flashes of light, or, rather, shadows, which, upon the ceasing of the sounds, give the effect of flashes of light upon the eye. The phenomena are doubtless to be referred to reflex nervous action. The sense of sight is more liable to such reflex effects than any other, often being affected by disturbances in remote organs, as, for instance, the stomach. Instances are on record where sight was so depraved by disordered digestion, that apparitions of people, distant places, etc., were seen by the patient, these symptoms entirely disappearing upon the removal of the disturbing cause.

JAPANESE PAPER.—The Japanese manufacture and use paper to as great an extent as perhaps any other nation. There are very few of their industrial operations that do not involve the use of this material. Both for ornamental and useful purposes it seems to be the *sine qua non*. Fans, lanterns, umbrellas, pocket handkerchiefs, cloaks, and windows are made of it. The paper strings and hats lately introduced into this country have been in use for centuries in Japan.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office.

FOR THE WEEK ENDING SEPTEMBER 1, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

81,572.—FLEXIBLE PIPE-JOINT COUPLING.—Squire Ainsworth, Pittsburg, Pa.

I claim, 1st, A pipe-connection, consisting of a conical recess in the end of one pipe, and a frustum of a cone at the termination of the end of the other, said pipes being so held together, by a clamp or other means of support, as to permit the rotary movement of one or both of the said pipes without variation from the plane of said movement, all as and for the purpose heretofore described.

2d, In combination with the foregoing, the spring-hinged coupling nut F, constructed substantially in the manner described, for the purpose specified.

3d The chain, G, in combination with the spring coupling, C', substantially as and for the purpose set forth.

81,573.—RAILWAY CHAIR.—Samuel T. Alexander, Pittsburg, Pa.

I claim a railroad chair, composed of a bed plate, A, and movable clamping pieces, substantially as and for the purpose set forth.

81,574.—HAND MILL.—Edwin Alsop, New York city.

I claim the arrangement, herein described, of the vertical shaft, F, removable grinding cone, H, tapering cylinder, I, corrugated vertically on its inside, hopper, J, scraper, L, cylinder K, with discharge orifice, K', wrought-iron frame, A, screw plug, G, shaft, C, fly wheel, B, and bevel gearing, D E, for the purpose set forth.

81,575.—MACHINE FOR MAKING BARRELS.—Saxton J. Arnold and Amos F. Clark (assignors to Saxon J. Arnold), Raymondsville, N. Y.

We claim the adjustable flanged cone-shaped hubs, C, when provided with the sliding pins, F, and springs, f, in the flange, E, in combination with the cone-shaped nuts, G, and screw shaft, A, as herein shown and described.

81,576. NON-CORROSIVE VALVE SEAT.—E. H. Ashcroft, Boston, Mass.

I claim, 1st, An alloy of nickel and copper, in any proportions, as set forth, for the construction of valves or valve seats for steam, etc.

2d, An alloy of gold or silver, in any desired proportions, for the construction of valves or valve seats for steam, for the purposes set forth.

3d, An alloy of aluminum, or aluminum alone, for the construction of valves or valve seats for steam, for the purpose set forth.

81,577.—MACHINE FOR COVERING CORD.—John Bachelder, Norwich Conn

I claim, 1st, The miter gears, a' a c, central shaft, C, supports, A1 A2, bobbin gears, d1, covering-cord carriers, F, guide, J, and gears, l L, in combination, a d operating so that each thread of a strand is covered with finishing material, and the several strands thus covered, twisted; the finishing material being laid in a converse direction to the twist imparted to the respective strands, all substantially as set forth.

2d The shaft, c, gears, a' a, shaft, C, sleeve, c', and pinions, c d, stationary support, A1, geared spool-carrying plates, d1, support, A2, rear, D, covering-cord carriers, F, and guide, J, combined and operating substantially as and for the purpose set forth.

3d, In combination with the above, the winding-and-twisting flyer, constructed and operating as described.

81,578.—SHUTTLE FOR LOOM.—Edward Baggett, Fall River, Mass.

I claim the combination, with the spring, A, and shoulder, C, of the spindle of the secondary spring, B, notched, slotted, and sliding substantially as and for the purpose described.

81,579.—MARKING WEATHER-BOARDING.—Joseph W. Bailey, New Orleans, La.

I claim the marking of weather boards in the manner herein described, during the operation of manufacturing them in the saw mill, or afterwards, during the process of dressing them in the planing machine, as and for the purpose set forth.

81,580.—WELL TUBE.—David Baker, Boston, Mass.

I claim, 1st, The double strainer, D, with intervening filtering material, arranged and operating in combination with or in continuation of a well-tube, substantially as and for the purposes set forth.

2d, The point, B, coupling, C, tube, A, and strainer, D, all constructed, arranged, and operating substantially as and for the purposes above set forth.

81,581.—WELL TUBE.—David Baker, Boston, Mass.

I claim, 1st, A conical point, F, formed with perpendicular sides, and with shoulders between the apex being formed with one or more drill edges, the sides, a, being elongated more or less, whereby the earth may be forced at right angles from said point in penetrating the ground, all substantially as shown and described.

2d, The combination of the interior perforated tube, A, and the exterior screen, H, when a chamber is forced between said tube and strainer, substantially as and for the purposes set forth.

3d, The arrangement of the point, F, in combination with the tube, E, and holes therein, strainer or screen, H, and the chamber or space formed between the strainer and tube, arranged and operating substantially as and for the purposes herein set forth.

81,582.—WELL TUBE.—David Baker, Boston, Mass.

I claim, 1st, The slide, J, whether placed on the inside or outside of a strainer, in a well tube, so arranged and secured to the point and operating as to leave the woven wire as the only tube near the lower part of the well, substantially as and for the purposes herein set forth.

2d, The combination of slide, J, with strainer, K, well tube, I, and coupling, L, with screw point, M, made and arranged substantially as and for the purposes herein set forth.

81,583.—MOP WRINGER.—Myron J. Barcalo, Mount Morris, N. Y.

I claim, 1st, The skeleton frame, B, made up of the hoops, b b, and standards, c c1 c2, and having combined therewith the rollers, C D D', and bail or handle, E, the whole being so arranged as to be applied to the inside of an ordinary pail, as herein set forth.

2d, The combination, with the stationary roller, C, of the pressing rollers, D D', mounted upon the rollers, f f, arranged as described, and operating in the manner and for the purpose specified.

81,584.—LANTERN.—Lewis F. Betts, Chicago, Ill. Antedated August 20, 1868.

I claim, 1st, The spring band, E, for securing the upper end of the globe, substantially as specified.

2d, Constructing a lantern base of two or more sections, D, provided with flanches, F, substantially as and for the purposes set forth.

3d, Securing the flanches and forming the carrying-holes for the guard by means of eyelets at d, substantially as described.

4th, The brackets or ledges, F, for supporting and carrying the guard at a distance from the main portions of the base, substantially as specified.

5th, The rod or ring, J, for strengthening the base and supporting the brackets or ledges without materially obstructing the light, substantially as specified.

6th, The extended guard rods, N, when such extended portion, e, is used for a hook or catch, substantially as described.

7th, The combination and arrangement of the guard, provided with hooks, e, with the brackets, F, substantially as and for the purposes specified.

8th, The spring top, K, in combination with the hooks, e, and bracket, F, for preventing the detachment of the guard, substantially as specified.

9th, The inclines or cams, b, for securing and tightening the lamp, in combination with the pins, c, substantially as specified.

81,585.—CAN TOP.—Lewis F. Betts, Chicago, Ill.

I claim, 1st, The inclines or cams, a, when turned or turned down so as to form the cam on the edge of the metal of which the breast or permanent portion of the top is constructed, and operating substantially as specified.

2d, The handle, f, when projecting through the removable top or cover, B, so that its ends will form the lugs or pins, d, substantially as described.

3d, The permanent portion of the top or breast, A, provided with the cams or inclines, a, in combination with the removable portion or cover, B, and lugs or pins, d, substantially as and for the purposes specified.

81,586.—CHURN DASHER.—A. T. Bleyley, Conception, Mo.

I claim, as a new article of manufacture, the churn dasher, consisting of the inverted funnel shaped tube, A B, dish-shaped perforated flange, C, and radial wings, D, all constructed and arranged to operate as herein shown and described, for the purpose specified.

81,587.—DECOLORIZING TANNIN LIQUID.—George Bossiere, Paris, France.

I claim, 1st, The use of the herein named substance, for decolorizing tannin juices, substantially in the manner described.

2d, The method of decolorizing tannin, by mixing with it the ingredients herein named, or either of them, in the proportions substantially as specified.

81,588.—REFRIGERATOR.—Edwin D. Brainard, Albany, N.Y.

I claim the employment of independent metallic chambers, closely sealed and secured together by clamps, in the construction of refrigerators, substantially in the manner and for the purposes above described.

81,589.—CHURN.—Victor M. R. Branch, Richmond Va.

I claim, 1st, The combination of the external dasher, B, with the internal dasher, B', when constructed as shown and described, and revolving in opposite directions, as specified, and for the purpose set forth.

2d, The combination of the dasher, B, hollow spindle, D, and pinion, F, with the dasher, B', spindle, C, and pinion, G, all as and for the purpose specified.

81,590.—APPARATUS FOR CARBURETING AIR AND APPLYING THE SAME.—Arthur Brin, Paris, France.

I claim, 1st, In apparatus, such as described, the combination, with the fluid reservoir and carbureting chamber, of an interposed feeding vessel, connected with both the reservoir and the carbureting chamber, in the manner described, and communicating with the latter by means of wicking, which supplies the quantity of fluid required to charge the air in said chamber, as set forth.

2d The combination, with the feeding vessel, and trough formed therein for receiving the liquid from the reservoir, of a series of siphons, of graduated length, and racks, and pinions, and shaft for elevating or lowering said siphons, and thus regulating the flow of the liquid to the carbureter, in the manner shown and specified.

3d, The employment, in connection with an apparatus such as described, of a blow pipe, to which air from the blower, and carbureted air from the gas-generating chamber, are supplied, substantially in the manner described and illustrated in fig. 5.

4th, The combination, with a tubular boiler, of two series of nozzles, arranged with relation to each other, and the boiler flues, as represented in fig 6, the one series communicating with a blower or air supply apparatus, and the other with the gas generating chamber of the carbureting apparatus, substantially as and for the purposes herein set forth.

81,591.—ORGAN PIPE.—George H. Brock, Huntington, N.Y.

I claim 1st, Constructing an organ pipe of a curved plate, A, held between the disks, B, as set forth.

2d, The plate, D, for guiding the wind from the wind chest against the mouth of a curved organ pipe, as specified.

3d, The pendant arrester, d, arranged in the curved organ pipe, substantially as and for the purpose herein shown and described.

81,592.—ADVERTISING SHOW-FRAME.—William P. Brown, Watertown, N.Y.

I claim the bulletin frame, as constructed of the outer frame, A, and inner frame, d, the latter divided by sash strips, a, and provided with panes of glass and removable backs, B, the frame, A, having moldings and fastening devices, adapted to secure the shutters, n, all arranged substantially as herein shown and described, for the purposes specified.

81,593.—SAFETY ATTACHMENT FOR EGG-CARRIER.—Abner H. Bryant, Wilmington, Del.

I claim the frame, with its cloth bottom arranged and constructed, as shown, as a safety attachment for the suspension egg carrier hereinbefore mentioned.

81,594.—HAND SPINNING MACHINE.—J. W. Burkhart, Cameron, Mo.

I claim the combination of the pulley, B, tightening pulley, f, provided with its adjustable support, e, pulley, b, and multiplying wheel, C, and spindle-arm, D, and adjustable support, E, of the same, when constructed and arranged substantially as and for the purpose described.

81,595.—SPOKE-TENONING MACHINE.—A. Harvey Calhoun, and George W. Collins, West Lebanon, Pa.

We claim the cutters, l n, attached to the adjustable straight bars, m, and the curved braces O, all suspended from the upper cross bar, a, of the sash frame, and constructed, arranged, and operating as herein shown and described.

81,596.—ANIMAL TRAP.—Alexander Campbell, Oxford, Ind.

I claim the latch, E, and hinged plates, F, having tongues, a, a, adapted to swing with the centrally pivoted platform, A, and arranged with relation to the notched plate fixed to frame, D, as herein shown and described.

81,597.—CORN-PLANTER.—S. O. Campbell, Leavenworth, Kansas.

I claim, 1st, The seed boxes, F F, arranged in combination with the shoes, I I, slides, K K, frames, L, and springs, M, with the projections, m, on the wheels, substantially in the manner as and for the purpose set forth.

2d, The clutch, composed of the two notched plates, D D', on the axles, C C', and the sliding or adjustable plate, E, provided with the arms, c, and placed on the axle, C', all arranged substantially as and for the purpose specified.

81,598.—BASE BALL TALLY-BOARD.—Thomas L. Canary, Brownsburg, Ind.

I claim, 1st, The use of the wire pins and variously colored balls, as represented at D D and C, for keeping game in base ball playing, substantially as described.

2d, The use of movable or adjustable pins for keeping a game, and the method of clearing the balls from the pins, substantially as described.

3d, The arrangement of the pins on the board, substantially as and for the purposes set forth.

4th, The slate, or other marking surface, in combination with the pins and ball, substantially as and for the purposes set forth and described.

81,599.—CHURN.—N. P. Chaney, Potsdam, N. Y.

I claim the combination, with the tubular beaters D, of the arm, B, provided with the scrapers, b b, substantially as and for the purpose described.

81,600.—ROLLING-MILL.—Joseph L. Chapman, Philadelphia, Pa.

I claim, 1st, The arrangement of three smooth conical rollers, rotating in different planes, and operating in the manner described, to form and feed the rod simultaneously, as above specified.

2d, The adjustment of the rollers, C' C', to form rods of different sizes, by means of ball and socket joints at one end, and the set screws and journal boxes at the other end, substantially in the manner shown and set forth.

81,601.—INTERFERING STRAP FOR HORSES.—Edwin Chesterman, Boston, Mass.

I claim leather interfering straps, in combination with rubber guards or projections, as herein shown, for the purpose specified.

81,602.—LOCOMOTINE SPARK ARRESTER.—Ira Choate, Exeter, N. H., assignor to himself and Daniel Lee, Boston, Mass.

I claim, 1st, The construction and arrangement of the tube, A, smoke stack, E, cover, D, and air apertures, a a a a a a, substantially as shown and described.

2d, The coupling, C B, cord or band, d, and guides, c c, substantially as shown and described.

3d, The coupling, C B, constructed as described.

4th, The arrangement of the cord, d, and guides, c c, substantially as described.

81,603.—VELOCIPEDE.—Andrew Christian, New York city.

I claim the operating device of a velocipede, consisting of the bell-crank levers, G H, one having a vertical and the other a horizontal lower end, and of the rods, m l, and crank, b, all made and operating substantially as herein shown and described.

81,604.—CLOTH GUIDING ATTACHMENT FOR SEWING MACHINES.—Jas. Cline (assignor to John Walls), Eaton, Ohio.

I claim the revolving holder, D, constructed as described, in combination with pin, B, standard, A, and spring, C, as and for the purpose described.

81,605.—DISTILLING APPARATUS FOR SPIRITS.—J. C. Cooksen, Lancaster, Pa.

I claim, 1st, An extra vessel III, with its chamber, A, in combination with the chamber, B, and its perforated bottom, and an upper chamber, C, with its conic head and central pipe, 9, pipes, 7 and 6, issuing from their respective departments, in the manner shown and specified for the purpose set forth.

2d, In combination with said extra vessel, III, with its chambers, A B and C, the still, D, with its pipe, 10, sleeve, 8, faucet funnel, d, mounted and arranged substantially as shown and described.

3d, The chamber, F, when combined with the worm of the condensing vessel and the extra vessel, III, by means of the several pipes, 6 7 8 and 9, substantially arranged in the manner and for the purpose specified.

81,606.—DRYER.—Cordial Crane, Boston, Mass.

I claim, as a new article of manufacture, a clothes-drying closet, constructed with doors and pivoted racks, and provided with inlet passages to receive heated air from register pipes, and with outlets for the escape of heated air saturated with moisture, all substantially as and for the purpose described.

81,607.—SLOTTING AUGER.—Peter Cunningham, Eckley Pa.

I claim a mortising or slotting auger, having rows of gouge or chisel lips formed on the edge of the twist, substantially as described for the purpose set forth.

81,608.—MACHINE FOR GRINDING METAL ARTICLES.—J. P. Curtiss, New Britain, Conn.

I claim, 1st, The arrangement of a series of clamping jaws, a, in the holder, A, substantially as and for the purpose set forth.

2d, The holder, A, made in two parts, one part being fitted into the carriage

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C, and retained by the screw spindle, k, while the second part is connected to the first part, so that it can be readily removed, all as and for the purpose described.

3d, The combination, with the holder, A, of the pitman, e crank motion, d e, and screw spindle, k, operating substantially as described.

4th, The sliding wheel, i, the wheel, j, forked arm, l, and screw spindle, k, in combination with the reciprocating holder, A, substantially as described.

81,609.—CHIMNEY COWL.—H. S Decker, New York city.

I claim the ventilator herein described, having an interior cone inclosed within the exterior walls of the ventilator, so as to provide an annular space between its exterior and the interior of the inclosing shell, which may be extended by a cylindrical attachment to the inner cone, as represented, the several parts being combined and arranged relatively to each other, and to the passage or pipe for distributing fresh air by the force of the wind upon the cone, substantially as shown and described for the purposes set forth.

81,610.—CIGAR PIPE—H. E Doster, Bethlehem, Pa.

I claim a cigar pipe formed of the parts, A B C D and E, arranged substantially as shown and described and for the purposes set forth.

81,611.—GRINDSTONE FRAME.—J. W. Douglas (assignor to W. Douglas and B. Douglas), Middletown, Conn.

I claim, 1st, The adjustable support or standard, H, with tool rest, J, applied to it, substantially as and for the purpose specified.

2d, The providing the shaft, E, with a screw thread, g, having a slot or groove, h, made longitudinally in it, in connection with the washers, Q Q, furnished with the lips or projections, i, to fit in the slot or groove, h, and the nuts, R R, on the screw thread, g, all arranged substantially as and for the purpose set forth.

81,612.—BALING PRESS—D. Dunn (assignor to himself and W. B. Miller), Lewisport, Ky.

I claim the detachable platen, G, in combination with the toggles, C C', and slide, D, all arranged substantially as and for the purpose specified.

81,613.—MACHINE FOR JOINTING STAVES.—L. B. Ecker, Union Bridge, Md.

I claim the combination of the plane, B, arranged in the adjustable gate or frame, L, as described, with the swinging carriage bed, I, and the stops, O, substantially as set forth.

81,614.—CHEESE PRESS.—Jacob Erdle, South Bristol, N. Y.

I claim the arrangement and combination of the screw, D, cross bars, E F, rods, a a, crank shaft, G, and weighted lever, H, operating substantially as and for the purpose set forth.

81,615—CHURN.—John Fassauer, Wheeling, Iowa.

I claim the dasher, constructed as described, and consisting of the radial arms, H H' c d c' d', and vertical connecting slats, e, perforated at f, all arranged upon the vertical shaft, B, to operate as herein set forth.

81,616.—HANDLE FOR DENTAL AND SURGICAL INSTRUMENTS.—H. T. Fogg, San Paulo, Brazil.

I claim adjustable handles for dental and other surgical instruments, constructed substantially in the manner and for the purpose herein shown and described.

81,617.—FRICTION CLUTCH.—E T. Ford, Stillwater, N. Y.

I claim the friction clutch, constructed and arranged with the drive wheels A A, and being composed of the cone, D, with its corresponding hollow sleeve E, the cam, 2 D, on its end, and the corresponding cam, 3 D, on the drive hub, C, arresting and relieving the motion or movement of the main axle, B, in its forward and backward motions, in the manner and for the purpose described.

81,618.—WATER-WHEEL.—Thomas H. Fox, Hanover, Va.

I claim, 1st, A verticle penstock, which is provided with lateral passages through its side, and vertical passages through its bottom, adapted for supplying two water wheels, arranged and supported substantially as described.

2d, The arrangement, consisting of the cylindric penstock, B' a, frame, A A, stay or suspension rods, N N, shaft, F, gate, C, wheel, D D e, the said being constructed as described, and so combined that the wheel, D D e is suspended on its shaft by the top of the penstock, as shown and described.

3d, The regulator, J, constructed as described, and arranged upon the bottom, C', of the penstock, in combination with passages, g', a wheel, L L' g, and a wheel, D D e, substantially as described.

4th A cylindrical penstock, which is constructed with lateral and vertical passages through it, and a chute, G, leading into its upper end, in combination with two water wheels and their regulators, aaranged to operate substantially as described.

5th, The upper revolving water-wheel, connected to and supported by the lower water wheel and vertical shaft, F, said upper wheel being detachable from the lower wheel, substantially as described.

81,619.—GARDEN IMPLEMENT.—Frank Fuller, New York city. Antedated May 5, 1868.

I claim, 1st, A universal garden implement, having one extremity provided with a chisel-shaped, bifurcated, or other pruning-edge or edges, and the other extremity provided with a forked, spoon-shaped, or other digger, dibble, drill, spade, and flower and fruit gatherer, the whole constructed substantially as described.

2d, Providing said universal garden-implement, or any implement of similar construction, or designed for similar uses, with one or more pruning loops, b, arranged between the two extremities of said implement, substantially as described.

3d, Providing a garden-implement with a shield or protector for such portion of the hand as may be most liable to be soiled or injured, said shield being constructed of india-rubber, leather, cloth, metal, or any other suitable material.

81,620—MACHINE FOR MANUFACTURE OF SCREWED BOOTS.—Joseph Galli, San Francisco, Cal.

I claim, 1st, The rigid jaw, B, and movable jaw, C, operated from below, attached perpendicularly to the plate, A, and carrying the screw-plate, a b, at their outer end, the whole constructed and operated substantially as and for the purpose herein described.

2d, The cutter, F, working close to the sole, together with its operating lever, G, link, d, and arm, H, constructed and operating substantially as described.

81,621.—WAGON AXLE.—G. S. Garth, Mill Hall, Pa.

I claim, 1st. An axle provided with collars, a b, of anti-friction metal, the latter (b) being cast on to a dove tailed collar, e, which is formed on or fitted to the axle, as herein shown and described, when the raised portions of the band, b, and shoulder, f, are encircled by a strengthening band, d, as set forth for the purpose specified.

2d, The strengthening band, d, encircling the raised portions of the band, b, and shoulder, f, substantially as shown and described for the purpose specified.

81,622.—COTTON PICKER AND CLEANER.—Samuel H. Gilman, Galveston, Texas.

I claim, 1st, The combination of the tapering trunk, having a flat slatted bottom, and segmental caps, J J, and the combing fan-blades, the extremities of which run at differential speeds, substantially as and for the purpose described.

2d, The pivoted oscillating, tapering, and obliquely set slats, constructed as described of bottom, k, applied so as to present a flat-surfaced grated bottom and inclined chutes, when the slats are in one position, and to present an irregular bottom when the slats are in another position, as shown in fig. 5, the said slats being connected to reciprocating bars, all substantially as and for the purpose described.

3d, The combing fan-blades s s, the extremities of which run with differential speeds, in combination with a trunk or tunnel, which is tapering in form and has its bottom formed of vibrating slats, constructed substantially as and for the purpose described.

81,623.—LIFE BOAT.—John R. Grace, Brooklyn, N. Y.

I claim, 1st, The partitioned cylindrical air-chambers, B B, arranged as described forming fixed parts of the bottom, C, and extending below the same to form one or more keels, as herein described for the purpose specified.

2d, The described arrangement of the air-chambers, E E, and cylinders, B B, with relation to each other, the walls of the boat, and the bottom, C, as herein described for the purpose specified.

81,624.—DISTILLING APPARATUS FOR SPIRITS.—Duby Green, New York city.

I claim, 1st, The boiler, A, of a still, when subdivided into a series of chambers, one above the other, these chambers being respectively connected with each other by means of the pipes B and C, and provided with slides, e, as set forth.

2d, Connecting the valves, g, that are in the discharge pipes, f, of the boiler, A, all by one rod, E, as described for the purpose specified.

3d, Providing the stirrer with two revolving disks, H H, made as described.

4th The arrangement and combination of the vessels, G T, V, which contain the stirrers, H, all made and operating substantially as herein shown and described.

5th, Conveying the vapors, from the boiler, A, to the stirring apparatus, so that no steam is required in the latter, as specified.

6th, The depalegmator, O when composed of a series of separate parts or vessels, p q r, each having two compartments, w and x, and all connected with each other by means of pipes, P, all made and operating substantially as herein shown and described.

7th, The arrangement and combination, in one distilling apparatus of the boiler, A, stirring vessel, G T, stirrers, H, rectificators, J L N, dephlegmator O, and cooler, S, all made and operating substantially as herein shown and described.

81,625.—COMBINED LATCH AND LOCK.—S. A. Green, Lexington, Ind.

I claim the two bolts, C, and D, the V-shaped tumbler-bar, with its projections p and d, the pivot bar, D, springs, E and H, and the arm, F, all constructed and operating substantially as shown and described, in combination with the rack, m, and pinion, k, branches, f f and g g, all as set forth.

81,626—BRUSH HOLDER AND MOP HEAD.—Henry P. Gregg, Cincinnati, Ohio.

I claim, 1st, The hook-bolt, E, operated by the thumb nut, F, with the head, A, and spur, G, for the purpose of holding a brush, substantially as described.

2d, The hook bolt, E, in combination with the bent wire, D, and head, A, for the purpose of holding a mop, as set forth.

3d, Combining a brush holder and mop head of the hook bolt, E, thumb nut, F, wire, D, spur, G, and head, A, substantially as and for the purpose set forth.

81,627.—SEEDING MACHINE.—Joseph Haas, El Paso, Ill.

I claim, 1st, The placing of the seed box, E, upon the frame, A, behind the wheels, B, when the lower part of said frame is supported by a caster wheel, C, applied to a bar, D secured to the under side of the frame, A, and all arranged substantially in the manner as and for the purpose set forth

2d, The arrangement of the lever, J, and spring, K, and the connecting rod, H, substantially as shown and described, for the purpose of disconnecting the rod, H, from the crank pulley, when necessary or desired.

81,628.—HARVESTER RAKE.—John C. Hall, Monroe, Wis.

I claim, 1st, The rake staff, constructed in two parts, G and H, carrying the rake, and pivoted directly to the reel shaft, K, substantially in the manner and for the purposes set forth.

2d. The jointed arm, N, when its outer end is rigidly fixed to the rake staff H, for the purpose set forth.

81,629.—SAFETY HARNESS SADDLE TREE.—John S. Hall, Pittsburg, Pa,

I claim the keeper, C, when arranged and operated substantially in the manner and for the purpose described.

81,630—COMBINATION PADLOCK.—Joseph L Hall, Cincinnati, Ohio.

I claim, 1st, The combination of a series of rotating tumblers with a rocking lock bolt, operated by the hasp only, and inclosed in a case having no key hole, substantially as described.

2d, The combination of a series of rotating tumblers, C', the rocking lock bolt, D, and the tripping lever, E, or its equivalent, all constructed and arranged to operate substantially as described.

81,631.—CORN HUSKER.—John M Hartnett, Waukegan, assignor to Robert L. Fabian, Lake Forest, Ill.

I claim, 1st, The hopper or chute, h h, with the metal extension, m m, as and for the purposes herein specified

2d, The hinged door, i i, with the pendant or fastening, q, as and for the purposes herein specified.

3d, The rolls, j j and n n, varying in size, working together, the combination of iron and wood, and the covering with alternate rings of metal and rubber, and of spurred and plain metal, as herein fully specified and for the purposes set forth.

81,632.—WATER WHEEL.—Joseph Hathaway, Woodstock, Vt.

I claim, 1st, the chutes, C, in combination with the gates, D, pivoted as shown, and connected to the annular plate, E, all arranged to operate in the manner substantially as and for the purpose set forth.

2d, The arrangement of the spindle, H, resting on the bridge tree, I, in connection with the tubular part, G, of the wheel shaft, which turns on H, and rests upon a fixed cone, ax, and the part, G', of the wheel shaft, which rests on the fixed spindle, H, all arranged to operate in the manner substantially as and for the purpose set forth.

81,633.—TIRE HEATER.—P. P. Hemstreet (assignor to himself and David Gudtner), Galesburg, Ill.

I claim, 1st, The outer rim, A, bottom, B, lids, Q, chimney, Z, lever, U rods, S, band, X, bars, N o, and inner rim, B, all constructed, arranged and combined as described, and for the purpose set forth.

2d, The dampers, D, rods, T and S", and lever, F, with rods, L and H, and rim, C, constructed and arranged as described, and combined with rims, B and A, and bottom, B, substantially as described and for the purpose set forth.

81,634.—RAILWAY SWITCH.—John A. Heyl (assignor to himself, Joseph G. Loring, and John H. Wiggin), Boston, Mass.

I claim the arrangement and combination of the arm, h, the crank, g, its shaft, f, pinion, e, and the toothed sector, d, with the lever, K, the switch and either or both pairs of connecting rods, A B C D, applied to such lever.

Also, the combination and arrangement of the studs, c c, and the slotted plate, L with either or both sets of connecting rods, A B C D, the lever, K the toothed sector, d, the pinion, e, the shaft, f, the crank, g, and the arm, h, the whole being applied to the switch and the roadbed, substantially as specified.

81,635.—AX.—J. W. Hilton and R. W. Green, Bradford, Pa.

We claim as a new article of manufacture a chopping ax, having a removable edge, when the two parts, A and B, composing said ax, are constructed substantially as and for the purpose shown and described, and secured together by removable dowels, d d, all as set forth.

81,636.—POTATO DIGGER—Henry P. Hinz, Dunton, Ill.

I claim, 1st, The combination of the shovel, H, the conveyers, N and P, and the screen, Q, arranged to operate substantially as and for the purposes set forth.

2d. The combination of the shovel, and the frames, F F, supporting the conveyer, N, when constructed and arranged in such a manner as to be adjustable vertically, so as to make the shovel run at different depths, as herein specified.

3d, In combination with the said shovel, the arrangement of the arms, G G, cross bar, J, arm, K, and lever, L, to operate in the manner specified.

4th, The arrangement of the apron, t, below the conveyor and over the chute, R, for the purposes specified.

5th, The arrangement of the chute, R, with the screen, Q, when used in combination with a conveyer, P, above the same, substantially as specified

6th, In combination with the conveyors, N P, and screen, Q, and its side chute, the arrangement of an elevator, U, so as to operate in the manner set forth.

7th, The arrangement of a tipping platform, Z, below and to the rear of the discharge of the elevator, to sustain the sack in the manner described.

8th, providing the said platform with one or more rollers, to facilitate the removal of the sacks when full, substantially as herein set forth.

81,637.—PROCESS OF MAKING VINEGAR.—S R. Holt, Worthington, Ohio.

I claim making vinegar from cider, beer, sorgho juce, alcoholic and saccharine mixtures by the herein described process for acetifying and clarifying the same, by allowing the fluid or wash to stand upon the pomace, and then filtering or drawing off the same, substantially as set forth.

81,638.—STEAM GENERATOR.—James Howard and Edward Tenney Bousfield, Bedford, England.

We claim, 1st, The construction and arrrangement of the vertical tubes, B, and their inner tubes with the horizontal tubes or pipes, C and A, whereby access is gained to the pipes, A, through the feed pipe, as above explained for cleaning the boiler.

2d, The construction of the horizontal pipes, A, arranged with the feed pipe, having covered openings, whereby to gain access to the interior of the boiler, for cleaning out the same.

3d, The internal tubes, constructed with lateral openings at bottom, as described, whereby to keep up the circulation of the water in the boiler, and the arrangement of the tubes, as described.

4th. The heating sections, G, for heating the feed water arranged in combination with the larger boiler sections, substantially as and for the purpose described.

81,639.—FOOL FOR LAYING OFF FURROWS FOR MILLSTONE DRESSING.—John C. Hunt and Joseph Temple, Terre Haut, Ind.

We claim, 1st, The combination of the graduated slide, D, and furrow marking arm, E, with a suitable holder, C, which may be secured to the stone centrally so as to revolve freely as desired, substantially in the manner and for the purpose set forth.

2d, The combination of the adjustable bar, F, with the arm, E, slide, D, and holder, C, substantially in the manner and for the purposes described.

3d, In combination with the arm, E, slide, D, and holder, C, the annular plate, A, and cam-plate, B, with the arms, a, and nibs, c, all arranged to operate substantially as and for the purpose set forth.

4th, The combination of the plate A, the plate B, provided with eccentric recesses, d, the arms, a, nibs, c, and springs, s, arranged in the manner and operating as specified.

81,640.—FENCE GATE.—Jasper S. Jewett, Ottawa, Ill.

I claim the oblique rails, f f, the top rail, g, the horizontal rails, i i i, the rope or chain, L, the staple, l, and the weight, M, in combination with the post, A, the pulley, K, the casing, N, the spring, O, and the rock shaft, Q, substantially as and for the purpose described in the foregoing specification.

81,641.—FABRIC FOR ROOFING AND OTHER PURPOSES.—Henry W. Johns, New York city.

I claim the combination of asbestos with felted or pulped matter, to form roofing and sheathing sheets, all substantially as described.

81,642.—CARRIAGE COUPLING.—Alfred S. Johnson (assignor to himself and Enock Van Wie), Waupun, Wis.

I claim a thill coupling, formed of the parts A and B, constructed, arranged and operating substantially as shown and described, for the purpose set forth.

81,643.—APPARATUS FOR CONCENTRATING EXTRACTS.—Thomas W. Johnson, New York city.

I claim the receiver, A, provided with a convex top, B, gutter, C, and cold water pipe, d, in combination with the agitator, F, and heating chamber, E, substantially as and for the purpose set forth.

81,644.—TINNERS' FIRE POT.—Charles W. Johnston.—Neponset, Ill.

I claim the arrangement of the draft tube, B, and the tool holding tubes, D, in a fire pot, A constructed and operating substantially in the manner and for the purpose herein set forth.

81,645.—LAMP.—Anson Judson, Brooklyn, N. Y.

I claim, 1st, The combination of the shell, B, of the burner, the ribs, F F, and the screw, G, or its equivalent, substantially as and for the purpose hereinbefore set forth.

2d, The combination of the ratchet shaft, C, wheels, d, and tube, e, substantially as and to the effect hereinbefore set forth.

3d, The combination of the cone, H, shell, B, and adjusting screws, D D, substantially as and to the effect hereinbefore set forth.

4th, The combination of the burner, B, projections, c c, flange, a, notches, b b, and right and left inclines f and g, in such a manner that by inserting the projections, c c, through the notches, b b, and turning the burner in either direction, said burner may be secured to the lamp cap, substantially as set forth.

5th, The cone or reflector, made of cast iron, with an enameled surface, as herein before set forth.

6th, The formation of the burner, B, in one piece with the wick tube, and in the manner hereinbefore described, by which the wheels for elevating the wick are received into the lower end of the wick tube, and all connection between the fountain and the interior of the burner, except through the length of the wick tube, is cut off, substantially as hereinbefore set forth.

81,646.—MACHINE FOR GRINDING REAPER KNIVES.—Frederick Judson, Castleton, N. Y.

I claim, 1st, The sliding carriage, U, so arranged as to have the slide brought to the grindstone adjustable vertically, substantially as herein set forth and specified.

2d, The stop, P, arranged and connected with plate, O, substantially as above described, and for the purpose specified

3d, In combination with the above, the bar, Q, guide rods, K K', standard, B, arm, C, screw, H, and set screw, I, the whole arranged and operating substantially as set forth.

4th, A yielding support for the knives, so constructed as to compensate for irregularities in the surface of the knives when passing under the stone, substantially as described.

81,647.—THRESHING MACHINE.—Daniel Kane, Tivoli, Iowa.

I claim, 1st, The combination of two fanning devices with a screening shoe, F, a grain elevating belt, and a straw carrier, said fanning device being arranged in the manner described, so as to operate substantially as and for the purposes specified.

2d, In combination with a threshing drum, an elevating grain belt and a straw carrier, arranged as described, the revolving beater, I, and the tossing and shaking blades, E, all being arranged over fanning devices and a screening shoe, substantially as described.

3d, The reversible or tilting bottom, N, to the laterally discharging clean grain trough, M, substantially as and for the purposes described.

4th, The arrangement of the pulley, J, with shaft, K, and gearing, l m, beneath the feeding board, B2, so that the cylinder is driven by a belt or other device which runs parallel, or nearly so, with the cylinder, substantially as herein described.

5th, The rolling drums, a1 a1, for the upper part of the straw carrier, applied to studs upon adjustable sides, a a, in combination with retaining racks, S', and pawls, Y, substantially as and for the purposes described.

6th, Providing for regulating the tension of the grain belt, G, by means of adjustable bearing blocks, l, of drum shaft, h, and bolts, p', said blocks being constructed and applied to bars, A3, substantially as described.

81,648.—PUMP.—William H. Keep, Stockton, Cal.

I claim the ball, J, in combination with the ring, I, the valve seat, H, the frame, P, the ring, G, and the valve seat, F, as and for the purpose set forth.

81,649.—STEAM AND FIRE REGULATOR.—Abraham Kipp, Jr., Sing Sing, N. Y.

I claim the slide valve, F, in connection with the elastic disks, D D K, compartments, C C', in chamber, A, arm, E, and beam, M, and the lever, L, or its equivalent, all arranged to operate in connection with a fire damper, substantially in the manner as and for the purpose set forth.

81,650—HAMES FASTENER.—John Koch and David Seachrist, Columbiana, Ohio.

We claim the pawl, D, when its tooth, a, is held against the ratchet bar, C, by means of the coil spring, b, which is protected from injury by being concealed in a recess in the pawl around the pivot, d, as herein shown and described.

81,651.—HOLD BACK.—Lois Kruse, Sabula, Iowa.

I claim the application, to the tongues of wagons and other vehicles, of the spring latch, arranged as hereinbefore set forth, which will secure the neck yoke in its place, and which may yet be removed when desired.

81,652.—TOOL FOR SLITTING BOARDS.—John Langham, Jr., Philadelphia, Pa.

I claim the combination of the sliding stock, C, provided with a cutter, with the ways, A, and supporting pieces, B, substantially as and for the purpose described.

81,653.—APPARATUS FOR EXTINGUISHING FIRES.—Rufus Lapham, Boston, Mass. Antedated August 20, 1868.

I claim, 1st, A placed reservoir, containing and holding a chemical fire extinguishing agent, or materials for readily generating such, when provided with pipes leading to one or more buildings, for the purposes specified.

2d, The application of pipes to connect said reservoir with one or more buildings and the various rooms of buildings, for the purposes set forth.

3d, The auxiliary gas generating retorts, S, one or more, used in connection with the placed reservoir, R, for the purposes specified.

81,654.—PROCESS OF TREATING PETROLEUM TO REMOVE THE MORE VOLATILE PORTIONS.—Robert G. Loftus, Chelsea, assignor to himself and Alonzo Farrar & Co., Boston, Mass.

I claim the separation of the petroleum into fine streams, and causing the same to pass through the atmosphere, so as to enable the latter to vaporize and dissipate the inflammable elements thereof.

81,655.—BORING MACHINE.—Chas. R Long, Louisville, Ky.

I claim, 1st, The arrangement of the sliding beds, B B, adjusted with relation to the fixed central shaft, b', and its pulley, from opposite ends of the frame, A, by means of the screws, m, constructed to operate as herein described, for the purpose specified.

2d, The staff, p, constructed and operating substantially as shown and described, in combination with the apron, M, of a boring machine, all as and for the purpose set forth.

81,656.—HAND LOOM.—Edwin Lowe, Burrows, Ind.

I claim the arrangement, with relation to the treadles, D, and levers, D, of the tappet shafts, B E, connected by gearing, the pawls, a a', and rods, C C', connected to the lay, A, all constructed to operate as herein shown and described, for the purpose set forth

81,657—ADHESIVE PLASTER.—J. Lynch, Columbia, S. C.

I claim the springs or stays, C, or their equivalents, in combination with an adhesive plaster, substantially as and for the purposes herein shown and described.

2d, Attaching one or more springs or flexible stays, rods, or bars to adhesive plasters, for the purposes described.

81,658.—CULINARY VESSEL.—A. F. Marston, Clinton, La.

I claim the arrangement, within the vessel, A, upon the perforated bottom, B, thereof, of the vessels, C, whose covers, D, are formed with tubes, E, having perforated upper ends, whereby a communication is formed between the said vessels and the removable steamer, G, supported upon its internal lugs, h, said steamer having partitions and a perforated bottom, all as herein shown and described for the purpose set forth.

81,659.—SOFA BEDSTEAD.—M. K. Maximilian, New York city.

I claim a sofa bedstead, composed of the two parts, A B, having their upholstered parts, a c, connected together by webbing, d, and having arms, C C, constructed as shown, attached to A, and connected to B, when desired, in the manner set forth.

81,660—CORN PLOW—Alex. McCreight, Tranquility, Ohio.

I claim, 1st, The drag bars, B B1, arranged as described, when operated by means of a fixed and movable attachment, substantially in the manner set forth.

2d. Operating drag bars by means of levers having movable fulcrum, substantially as described.

3d, The drag bars, B B1, as described, as in combination with levers, D, and cross bar, C, substantially as and for the purpose set forth.

81,661.—HANGING CIRCULAR SAW.—William McDonald, Calias, Me.

I claim the fixed collar, B, provided with the series of pins, a, adapted to pass through the saw, C, and into the loose collar, D, said saw and collar, D, being clamped firmly to the fixed collar by the screw nut, E, as herein shown and described.

81,662.—GATE.—J. H. McKnight, Oakwood, Mich.

I claim, 1st, The gate, C, formed by the combination of the horizontal bars c1, pivoted connecting bars, c2 and c3, pivoted diagonal bar, c4, and weight box, D, with each other and with the gate post, B, said gate, C, being constructed and operated substantially as herein shown and described.

2d, The combination of the levers, F, and cord or chain, G, with the weighted pivoted gate, C, substantially as herein shown and described, and for the purpose set forth.

3d, The weighted catch, J, in combination with the gate, C, post, B, and levers, F, substantially as herein shown and described, and for the purpose set forth.

81,663.—SHELLAC VARNISH.—George S. Meikle, Sterling, Ill.

I claim a varnish formed of gum shellac, combined with the ingredients herein named, and substantially as described.

81,664. EXPANDING MANDREL OR BORING TOOL.—James C. Millerd, River Point, R. I.

I claim, 1st, The combination, in a boring tool, of the boring plates, B B, right and left handed screw, a, and block, b, when operating together within a mortise or eye in the shank A, all substantially as shown and described, and for the purpose set forth.

2d, The screw, D, arranged to operate in combination with the above-claimed parts, substantially as herein described.

81,665.—MACHINE FOR MAKING CANDY TOYS, etc.—Thomas Mills and George M. Mills, Philadelphia, Pa.

We claim the die rolls, A A, with the molds disposed thereon as described, and operating in combination with the side rolls, C C, substantially as and for the purpose specified.

Also, in combination with a pair of die rolls, the described system of endless bands, I and N, when arranged and operating in the manner and for the purpose set forth.

81,666.—BRIDGE.—Richard Montgomery and Mary J. Montgomery, New York city.

We claim the combination, substantially as and for the purpose herein set forth, of an intermediate binding plate, D, with the doubly corrugated plates, A A, forming the double corrugated beams and columns herein described.

Also, in the construction of bridges, roofs, and similar structures, with double corrugated beams and columns, the combination of diagonal struts and braces with said beams and columns, by passing the stays or braces between the opposite plates of the beams and columns, substantially in the manner and for the purpose herein set forth.

81,667.—APPARATUS FOR HANDLING STEAMBOAT STAGES.—Ferdinand Moore and George Hastie, Florence, Ind.

We claim the rolling carrier beam, D, provided with the rollers, s s, fall and tackle, F, wheel, E windlass, H, hand rope, n, journal, m, p ns, a a, and guides, n n, or their equivalents, when used in connection with the guides C C, in the manner substantially as described, and for the purpose set forth.

81,668—STEAM GENERATOR—William Moses, Buffalo, N. Y.

I claim the auxiliary steam generating vessels, when constructed with contracted shanks, and induction and eduction orifices, and applied to the crown sheet and sides of a boiler, substantially as herein set forth.

81,669.—DRAFT EQUALIZER.—George A. Mosher, Champlain, N. Y.

I claim the clevises, D, constructed as described, and provided with a series of holes, b, adapted for the passage of a pin, a, whereby said clevises are pivoted to the cross pieces, C, of the centrally pivoted double tree, A, so as to be longitudinally adjustable thereon, as set forth.

81,670.—MANUFACTURE OF GUNPOWDER AND BLASTING POWDER.—Gustav Adolph Neumeyer, Altenburg, Saxe-Altenburg (assignor to August Klein, Leipzig), Germany. Antedated August 25, 1868.

I claim an explosive powder, for blasting and for fire arms, when made of the ingredients and in the manner and proportions herein set forth.

81,671.—FURNACE FOR SMELTING ORES OF GOLD, SILVER, etc.—Eugene W. Nohl (assignor to Charles M. Gray), Chicago, Ill.

I claim, 1st, The construction and arrangement of the smelting chamber, with the cupel and diving flue, for heating the same, substantially as specified.

2d, The opening, K, through the top of the furnace, and above the gas flue or passage, for the purpose of admitting, and mixing with the burning products, atmospheric air to intensify the combustion, and direct the flame on the ore bed or table, and into the cupel, substantially as and for the purpose described.

3d, The flues underneath the ore bed or table and the cupel, as and for the purpose described.

81,672.—DOOR BELL.—Oliver B. Oakley and Hiram Roseкrans, San Francisco, Cal.

We claim the hammer bar, G, the cam, F, and the two arms, a and b, together with the knob, I, operating by horizontal or straight pull, either near the bell gong or at a distance, substantially as and for the purpose herein described.

81,673.—CIRCULAR SAW MILL.—John Orm, Paducah, Ky.

I claim adjustably connecting one or more of the truck frames, D, to the toothed rack, F, by means of the coupling, G, as herein shown and described for the purpose set forth.

81,674.—WASHING MACHINE.—Joseph Osterhout, Rock Island, Ill.

I claim the holders, J J, secured to the inner sides of the suds box, and applied to the band or apron, I substantially as and for the purpose specified.

81,675.—WHIP SOCKET.—Louis J. Parsons (assignor to himself, John R. Linton, and O. E. Linton), New Bedford, Mass.

I claim, 1st, Uniting the edges of a leather whip socket by means of a metal fastening, substantially as and for the purpose described.

2d The bottom of the whip socket, constructed and united to the tubular portion of the same, substantially as and for the purpose described.

81,676.—BALL ALLEY.—James Dillon Patrick, San Francisco, Cal. Antedated August 25, 1868.

I claim, 1st, The springs, I I, attached to the spring board, I, the holes, E, in the pins through which the cords pass, and the weights, J J, in combination with the cords, substantially as described.

2d, Constructing the ways, C C, so that the balls that roll from the sides of the alley will not come in contact with those that are thrown against the bank or end of the alley, substantially as herein set forth.

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81,677.—CAR AND TRACK FOR ELEVATING ON INCLINED PLANES.—John W. Pearce, Suisun, Cal.

I claim, in combination with the double-inclined track of the described construction, a store or freight truck, having one axle shorter than the other, to adapt it to run on said track, and keep a horizontal position while passing up or down the same, substantially as described.

81,678.—WHEEL FOR ANIMAL CAGE.—George R. Peckham, Worcester, Mass.

I claim a wheel for animal traps or cages, with the bars, y, formed by cutting slots, x, in a sheet of metal, as described and for the purposes set forth.

81,679.—BOILER FEEDER.—William Crellin Pickersgill, Providence, R. I.

I claim the combination of the float, B, rod, C lever, D, with the steam valve, F, steam cylinder, G, and cocks, H and I, substantially as and for the purposes set forth.

81,680.—QUARTZ MILL.—Roswell Plummer, Brooklyn, N. Y.

I claim the within described mill for grinding quartz, consisting of the reversible metallic disks, C D and E F, constructed, arranged, and operating as and for the purpose set forth.

81,681.—PUMP.—John Poppe, Greenpoint, N. Y.

I claim the combination of the inclined arm, C, with the valve, H, wheel, B, and valve plate, L, substantially as herein shown and described and for the purpose set forth.

81,682.—IRON PIER.—William B. Porter, Plattsmouth, Nebraska.

I claim an iron pier composed of a series of tubes encompassed or enclosed by a shell filled with concrete, and all secured together in the manner substantially as herein shown and described.

81,683.—KNITTING MACHINE.—E. K. Pray, Holderness. N. H.

I claim, 1st, The ring, A, constructed with that part to which the cams are secured, detachable, substantially as and for the purpose set forth.

2d, The comb nation with the ring, A, having the detachable part, B, of the segment, C, substantially as and for the purpose described.

81,684.—EYELET.—George W. Prentice, Providence, R. I.

Antedated August 15, 1868.

I claim the article of an eyelet, of the composition of material herein set forth, as a new manufacture,

81,685.—HARVESTER RAKE.—K. H. C. Preston, Manlius, N. Y., assignor to himself, Stephen Cheney, and M. B. Snook.

I claim, 1st, The combination of the crank arms, d, of the beaters, F, the spiral springs, e, revolving wheel, D, conical roller, G, and arm, g', all constructed, arranged, and operating as described for the purpose spessfied.

2d, The arm, g', attached to the inner end of the rake, E, in combination with the projection, h, attached to the arm, g, all arranged substantially as described, for the purpose of keeping said rake down or near the platform, while traveling over the same.

81,686.—HARVESTER.—K. H. C. Preston, Manlius, N. Y., assignor to himself, Stephen Cheney, and M. B. Snook.

I claim, 1st, The joint, L, when the screw bolts, carrying the boxes, n n, are provided with eyes, m m, to receive the journals of the cross-head, R, upon the connecting rod, K, os herein described, for the purpose specified.

2d, The projections, f, on the pawls, F, on the wheels, B, in connection with the beveled sliding cellars, H H, on the axle, E, all arranged to operate in connection with the ratchet, G, substantially as and for the purpose set forth.

81,687.—BOOKCASE BEDSTEAD.—Eliza Putnam, Boston, Mass.

I claim the combination, with a case and bedstead, of a removable dividing piece, k, substantially as and for the purposes described.

81,688.—WASHIGN MACHINE.—William Ross and James M. Adamson, Day's Store, Pa.

We claim, 1st, A wsshing machine, for washing clothing, composed of the tub, A, and rubber, B, and a clamp, C, for holding the clothing, operated by a handle upon the same, said clothing being held down upon the rubber, B, by a treadle, G, substantially as shown and described, and for the purposes set forth.

2d, The clamp, C, composed of two parts or jaws, connected to the arm, D, by a universal joint, substantially as shown and described, and for the purposes set forth.

3d, The arm, D, and connecting rod, F, and upright, E, and treadle, G, in combination with each other and with the clamp, C, and washing tub, A, and rubber, B, substantially as shown and described, and for the purposes set forth.

81,689.—CAR COUPLING.—Alfred Sanders, Penn Yan, N. Y.

I claim the combination of the side lugs, i i, oblong openings, k k and pins, l, with the spring lever, C, and cam rod, d g h, the whole so arranged as to form a double fastening, and allow the strain to be transferred from the pin to the lever, as herein set forth.

81,690.—COUNTER AND SHANK FOR BOOTS AND SHOES.—Michael E. Savoy, Corinth, N. Y. Antedated August 29, 1868.

I claim the curved metallic shank, A, and counter, B, when the latter is provided with the adjustable arms, a, for securing said counter at its forward end to the shank, , constructed and aaranged as herain shown and described, when stamped from one piece of metal.

81,691.—SOFA AND BED.—William H. Schwalbe, New York city.

I claim the combination and arrangement of screw bolts, K, back, I, arms, H, bed, A C D, and foot board, L, as herein represented and described.

81,692.—SHEET-METAL CAN.—Conrad Seimel, Greenpoint, N. Y., assignor to Chas. Pratt, New York city.

I claim the square or rectangular sheet-metal can, constructed, as described, of the two pieces, A A, bent to have the sides, a a, at right angles to each other, and having formed at the angles the semi-cylindrical projections, b, the ends of said parts, a a, being rolled to form projections, c, lapping within and over each other, as herein described for the purpose specified.

81,693.—PROTECTING PLANTS, ETC.—James Shepard, Bristol, Conn.

I claim, as a new article of manufacture, a plant protector, when constructed and arranged specially as and for the purpose described.

81,694.—RATCHET DRILL.—Charles Sinclair, New York city.

I claim, 1st, The combination of the spindle, A, retaining handle, D, and operating handle, E, with the pawl, G, and ratchet wheel, F, and with the ratchet wheel or disk, C, having internal gear, with the pinion, e, toothed wheel, I, and spring bolt, J, all made and operating substantially as herein shown and described, the toothed wheel, I, having ratchet teeth formed on its inner edge, as set forth.

2d, The combination of the drill spindle A, pinion, I, and spring bolt, J, when constructed and arranged as described, as an adjunct to the other mechanism for communicating rotary motion to the drill, substantially as described.

81,695.—HOT-AIR REGISTER ATTACHMENT.—Hector Sinclair, New York city.

I claim, 1st An attachment for hot-air registers, provided with a hollow dust-separating mechanism, substantially as and for the purpose described.

2d, The combination, with a hot-air register, of the casing, F, fan blower, D, and dustpan, E, substantially as and for the purpose described.

3d, The combination, with the hot-air register, of the casing F, reservoir, C, and fan blower, D, substantially as and for the purpose described.

4th, In combination with a hot-air register, a fan blower, dust receptacle, and water reservoir, substantially as described, for the purpose specified.

81,696.—SELF-ACTING WAGON BRAKE.—T. Smith, California, Mo. Antedated Aug. 29, 1868.

I claim the self-acting wagon brake, composed of the block, e, pivoted to the adjustable slide, G, which is itself directly attached to the spring, E, and operated by the rods, h and I, and yoke, J, when the parts referred to are constructed as described, and combined and arranged in the manner and for the purposes specified.

81,697.—COMPOUND TOOL FOR CUTTING AND SHEARING BOLTS.—T. Smith, California, Mo. Aug. 21, 1868.

I claim the improved bolt cutting and shearing tool herein described.

81,698.—COMPOSITION FOR PAVEMENTS.—H. F. Snow and J. H. Davis, Dover, N. H.

We claim the combination of wood sawdust, or comminuted wood or bark, with the tarry residuum, and a mineral matter or matters and an acid, as specified.

81,699.—SLEIGH.—L. A. Spickler, Clear Spring, Md.

I claim, in a sleigh, adapted to be drawn by power applied in front, locating the point of attachment of the shafts behind the upturned part, D, upon the rave, C, or bifurcated iron, A, as herein shown and described for the purpose specified.

81,700.—GANG PLOW.—P. H. Standish, Marnez, Cal., assignor to himself and Oliver C. Coffin.

I claim, 1st, The wheel, E, lever, M, with pawl, I, and foot pawl, N, and manner of arrangement thereof.

2d, The tongue adjusting rod, J, clevis, R, plate, P l, as arranged and secured to the bed or beam, B.

3d, The construction and arrangement of the bed, B, and the manner of attaching the standards thereto, in combination with the tongue adjusting rod, J, clevis, R, and plate, P l, as shown and described.

4th, The crank-shaped standards, with slotted end and set screw, substantially as set forth.

81,701.—SULKY PLOW.—A. R. Stanley and H. W. Ensign, Shullsburg, Wis.

We claim, 1st, The pivoted plow beam, N, spring catch, O, and eccentric, H, arranged to operate in the manner substantially as and for the purpose set forth.

2d, The combination of the lever, G, attached to the eccentric, H, the shaft, F, pinion, E', rack, D, and spring catch, O, fitting over the end of the plow beam, N, substantially as described for the purposes specified.

81,702.—VEGETABLE FIBER AS A SUBSTITUTE FOR HAIR.—Werner Staufen, Paris, France.

I claim the manufacture, substantially as above set forth, of a species of vegetable hair from the fibrous material which grows through and proceeds from the bark situated near the foot of the palm known as the *Levistonia Chinensis, Roxb.*, of *Latania Chinensis, Tacq.*

81,703.—VENTILATING-SASH ADJUSTER.—W. C. Stickney and J. McGee, Steubenville, Ohio.

We claim the combination of the three-armed plate, C, and sliding rod, E, with the coiled spring, G, friction block, H, and thimble, F, substantially as herein shown and described.

81,704.—WATER WHEEL.—Brush Sutherland, Chicago, Ill.

I claim, 1st, The combination of a stop-water, c, with the flange of the wheel and the gate, C, arranged to operate in the manner and for the purposes shown and described.

2d, The dome, G, provided with a vertical rim, H, and supporting arms, I, arranged in relation to the flange, F, substantially as described and for the purposes set forth.

3d, The combination of an adjustable stop water, h, with the rim, H, and the flange of the wheel, in the manner and for the purposes specified.

81,705.—OILER FOR MACHINERY.—Newton Tallman, West New Brighton, N. Y.

I claim, 1st, The perforated inner chamber, a, and spring, F, in combination with each other, and with the nozzle and bottom of an oil can, substantially as and for the purposes herein set forth.

2d, The adjusting screw, b, and nut, c, in combination with the spring, E, and the cylinder or chamber, a, substantially as and for the purpose herein specified.

81,706.—HORSE HAY RAKE.—Benj. C. Taylor, Dayton, Ohio.

I claim the pieces, E E, and their arrangement with reference to the bars, A and B, the spring, F, and bolts, C C, in the manner substantially as described, and for the purposes specified.

81,707.—REVERSING CUTTING MACHINE.—S. D. Tripp, Lynn, Mass. Antedated August 21, 1868.

I claim, 1st, The means employed for operating the cutter shaft, B, to wit, the bars, g h i, pivoted guide, L, and the pivoted bar, M, on plate, H, in connection with the cross head, G, on the journal of shaft, E, provided with the pins, e e, all arranged to operate substantially in the manner as and for the purpose set forth.

2d, Attaching of the plate, H, to the framing, A, in such manner as to admit of the same having a reciprocating movement imparted to it, substantially as shown and described.

81,708.—SAW SET.—John Uhl, Brooklyn, N. Y.

I claim the construction and arrangement of block, A, swinging table, B, screw, G, adjustable plate, D, anvil, E, punch, d, holding device, e, spring, f, substantially as herein described and for the purpose specified.

81,709.—BLEACHING AND DYEING FEATHERS.—Adolphe Pierre Viol and Césaire Pierre Duflo, Jr., Paris, France.

We claim the within-described process of treating black, gray, brown, or otherwise tawny-colored feathers, by first subjecting them to a bleaching, and afterwards to a dying operation, substantially as and for the purpose set forth.

81,710.—LAMP CHIMNEY CLEANER.—N. A. Vurgason, Brooklyn, N. Y.

I claim a lamp chimney cleaner, having four brushes, B B C C, affixed on the bars, b b, in combination with the staff, A, and spring band, a, of rubber or other suitable material, all substantially as and for the purpose shown and described.

81,711.—MEDICAL COMPOUND FOR TREATING HORSES, CATTLE, ETC.—Garrett Van Wagenen, Racine, Wis.

I claim the remedial compound, composed of the above mentioned ingredients, and prepared in the manner described.

81,712.—CAR SEAT.—F. F. Wagner, Harrisburg, Pa.

I claim, 1st, Providing the projecting lugs, t, on the axles or pins, B, by which the swinging arms, C D, are pivoted to the seat frame for the purpose of elevating the front end of the seat, so as to have the seat inclined backward in whatever position the arms may stand, as specified.

2d, The pin, or bolt, a, for locking the swinging arms, C D, in any desired position, when said pin is fitted into one of the toothed wheels or segments by which the arms are connected for the purpose of having them move simultaneously, as set forth.

81,713.—PAPER RESERVOIR FOR COMPRESSED AIR.—C. W. Walley, New Orleans, La., assignor to New Orleans Pneumatic Propelling Company.

I claim the paper air tank, A, when closed at the extremities with metallic heads, B, and otherwise constructed in the manner and by the use of the means herein described for the purpose set forth.

81,714.—STOVE PIPE DRUM.—George S. Walker, Erie, Pa.

I claim the arrangement, within the drum, H, and with relation to each other, of the curved fire-plates, F F', to direct the products of combustion in the described manner herein set forth and shown.

81,715.—HAT.—M. S. Watkins, Mansfield, Texas.

I claim, as a new article of manufacture, a hat formed with radial indentations in the crown and rim, as described, and provided with a lining, perforated opposite the said indentations, the metallic band of the lining being bent at the front of the hat, as and for the purposes herein set forth.

81,716.—CHURN.—Joseph Watts, Brazil, Ind.

I claim, 1st, The suspended screen, R, and hinged lid, O, in combination with the body, A, of the churn, and with the revolving paddles, L, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the crank shaft, C, arms, J, and paddles, L, with each other, and with the body, A, and screen, R, of the churn, said parts being constructed and arranged substantially as herein shown and described, and for the purpose set forth.

81,717.—BELT PUNCH.—David M. Weston, Boston, Mass., assignor to Greene, Tweed & Co., Brooklyn, N. Y.

I claim the belt-punch, having its lower jaw, A, slotted at C, for the passage of the cutter, B, of the upper jaw, and provided with the gage, D, carrying the slotted guard, E, all operating as described, the jaws being opened by the tension of the rubber spring, F, held in sockets or recesses of the handles, as herein set forth and shown.

81,718.—TUMBLER BRUSH.—Gerhart Wiesler, Chicago, Ill.

I claim the combination of the cylindrical head, B provided with the bore, D, and the cylindrical filler or plug, C, arranged within the bore, as and for the purposes specified.

81,719.—STENCH TRAP.—F. H. Williams, Syracuse, N. Y.

I claim, 1st, A valve chamber, N, which is constructed with a tubular valve seat, B, and a pipe-connecting collar, C, substantially as and for the purposes described.

2d, The construction of valve chamber, N, of sections, A A, one of which has an internally and externally projecting collar, B, and the other an externally projecting collar, C, substantially as and for the purposes described.

3d, Valve, I, applied to the inner end of collar, B, and held up to its seat by a spring, g, which rests upon a bridge, applied to the upper end of said collar, in combination with the chamber, N, substantially as described.

4th, The inverted cup, f, applied over the upper end of valve stem, e, so as to protect the spring, g, substantially as described.

5th A crowning or convex valve, I, which is suspended by a spring, g, and applied to a collar, B, of the chamber, N, substantially as described.

81,720.—ADJUSTABLE MEASURING RULE.—Isaac Williams, Westfield, Ind.

I claim the combination of the pivoted adjustable brace, J, slotted at, i, with the graduted part, B, and its slotted extension, G, and with the graduated part, A, and its slotted extension, D, all constructed as described, for the purpose specified.

81,721.—PAINT COMPOUND.—Henry F. Wilson, (assignor to Jacob J. Kamm), Fort Wayne, Ind.

I claim the combination of the above specified ingredients, as and for the purpose specified.

81,722.—MACHINE FOR CARVING WOOD.—Hanson H. Adams, Newburyport, Mass.

I claim, 1st, The combination, with the vertical adjustable form, j, of the vibrating forms or supports, n, and laterally sliding or adjustable cutter head and its cutters, under the arrangement and for the operation as herein shown and specified.

2d, The combination, with the frame, j, laterally adjusting cutter head, and vibrating truss frames, by which the cutter head is supported, of the lever, z, and spring, o', or its equivalent, consrtucted and arranged to operate substantially as and for the purpose set forth.

81,723.—LIQUID SAFE.—Garret D. Anderson, Montrose, N. Y.

I claim, 1st, An oil or liquid tank, constructed without any joint at either or all of the points lettered, h i k l, in the drawing, substantially as herein specified.

2d, An oil or liquid tank, provided with a bottom composed of two inclined surfaces, and provided with a depression at about the central point, substantially as and for the purpose herein set forth.

3d, The combination, with a tank constructed in either of the above specified ways, of an enclosing case, of wood or other material, substantially as herein specified.

4th, The combination, with said tank for containg oil or other inflammable liquid, of some suitable fire proof material, substantially as and for the purposes herein specified.

81,724.—GANG PLOW.—James H. Andrews, Benicia, Cal.

I claim, 1st, Pivoting the pole, C, to the hounds, D D, by the rod, E, and linking the rear end of the pole to the arm, G, of the shaft, F, or equivalent device for raising and lowering the plows without lifting other parts of the frame, substantially as described.

2d, The double jointed frame, I, having an apron, J, attached and arranged to operate in the manner substantially as and for the purpose set forth.

3d, The manner of connecting the plows to the frame by the clips, M M, slots, N N, with bolts and nuts, substantially as described.

81,725.—GRINDING MILL.—George N. Annan, Buffalo, N. Y.

I claim the combination of the blocks, c c, pressing outward upon the journals of the bed, and the screws, f f and g g, pressing inward upon the four corners of the bed thus opposing each other, the whole arranged as described, and operating in the manner and for the purpose specified.

Also connecting the heads, D, to the ends of the case, by the locks, c l, in addition to the ordinary screws, whereby the great strain is removed from the screws, as herein set forth.

81,726.—HAY FORK.—Charles S. Ambruster, (assignor to himself and Charles H. Richman), Woodstown, N. J.

I claim, 1st, The combination of the plate, C, hook, c, stop, m, spring, n, trigger, o, and the rope or chain, r, substantially as and for the purpose described.

2d, The combination of the tripping attachment, above described, with the arms, a a, shanks, s s, tines, t t, block, I, and connecting cords, chains, or rods, e e', substantially as and for the purpose specified.

81,727.—PAPER CLASP.—J. C. Arms, Northampton, Mass.

I claim the paper slide, B, constructed and applied to rolls of tape, ribbon, etc., substantially as described.

81,728.—CORK EXTRACTOR.—Jacob Autenrieth, Philadelphia, Pa.

I claim the application to a cork, of an endless flat strip or loop of non-elastic material, in the manner and for the purpose herein described and represented.

81,729.—BRAKE FOR MECHINERY.—D. S. Baker, West Bloomfield, N. Y.

I claim a friction brake, constructed and operating in the manner as shown and described.

81,730.—PLOW.—John Ball, Canton, Ohio.

I claim 1st, The double point, I, when constructed as described, and operating substantially as and for the purposes herein set forth.

2d, The corrugated beam, D, in combination with the corrugated handles, E E, when arranged so as to be adjustable, substantially as and for the purposes herein set forth.

81,731.—CLEVIS FOR PLOW.—John Ball, Canton, Ohio.

I claim, 1st, The clevis, C, constructed as described, in combination with the adjustable loops, D D, for the purpose of raising or lowering the front end of the clevis, substantially as herein set forth.

2d, The levers B B, pivoted to the sides of the plow beam, A, and their lower ends pivoted to the rear ends of the clevis, C, in combination with the rod, F, and spring, G, constructed as described, and operating substantially as and for the purposes herein set forth.

81,732.—SPINDLE STEP.—Joseph B. Bancroft, Milford, Mass.

I claim the arrangement and combination of the ring or flange, D, with the spindle, its step, and cap, the whole being substantially in manner and for the purpose or objects as specified.

81,733.—GAS BURNER.—Arthur Barbarin, New Orleans, La.

I claim, 1st, The method, herein described, of letting on the gas to the burner or shutting off therefrom, by the employment, in connection with the pipe or conduit for supplying gas to one or more burners, of a reservoir of quicksilver, glycerin, oils or other non-freezing liquid in which the end of said conduit is immersed, the pressure of the gas in said conduit being regulated in the manner specified, so that so long as the pressure does not exceed a certain limit, the gas will be retained in its conduit by the resistance of the said liquid, without the use of stop-cocks or other means ordinarily employed, but whenever the pressure is increased so as to exceed the said limit, the gas will overcome the resistence of the liquid, and pass from its conduit to the burner, as set forth.

2d, The use and application, for the purpose specified in the preceeding clause, of naphtha or other hydrocarbon liquid substantially in the manner described, so that the said liquid shall not only constitute the stop-cock of the gas conduit, but shall also carburet the gas when the latter is forced through it by the presence of the gas in said conduit.

3d, The combination, with a reservoir containing quicksilver or other suitable liquid, and carrying the gas burner, of the bent end of the gas induction pipe, held within the reservoir, and arranged as described, so as to be adjusted to a greater or less depth in the liquid in which it is immersed, the said liquid operating in connection with the pressure of gas in said pide, to shut off and let on the gas to the burner, as set forth.

4th, The combination, with a burner to which the flow of gas is regulated by means of quicksilver, oils, or other liquids, in connection with the pressure of gas in the gas conduit, as described, of a gas igniting device, composed of spongy or finely divided platium, arranged above the orifice of the burner so as to be brought in contact with the gas issuing therefrom, as and for the purposes set forth.

81,734.—SELF-LIGHTING GAS BURNER.—Arthur Barbarin, New Orleans, La.

I claim a gas lighting device, consisting of spongy or finely divided platium, combined with fine projecting platium wire and fine projecting wire points or ends in the manner herein specified, the said device being applied to a gas burner, and arraged to operate in connection therewith, substantially as shown and set forth.

81,735.—APPARATUS FOR LIGHTING GAS.—Arthur Barbarin, New Orleans, La.

I claim, 1st, The application and use of clock work, or equivalent mechanism, in combination with the armature of an electro-magnet, to let on or shut off the gas, and control at the same time the operation of the illuminating agent, substantially as described.

2d, The combination of the rotary valves for supplying gas to the burners, and the mechanism for operating and stopping the same, with the armature of an electro magnet, under such an arrangement that the motion of the said armature towards its magnet shall leave the said valves free to revolve, substantially as set forth.

3d, The arrangement relatively to each other of the valves for supporting the hydrogen and illuminating gases to their respective burners, so that the hydrogen gas shall be supplied to its burners before the opening of the valve through which the illuminating gas passes, substantially as shown and described.

4th, The method of transmitting a current of electricity from a main battery to the magnets of one or more valve-operating apparatus, by means of an apparatus arranged and operating so as to effect the momentary closing of the circuit between the said battery and magnets, substantially as shown, and for the purposes described.

5th, The circuit-closing apparatus herein described, the same consisting of the combination of a revolving needle, and its actuating and stopping mechanism, with the armature of an electro-magnet, the whole being constructed and arranged so that the momentary passage of a current of electricity through the said magnet shall so move its armature as to effect the revolution of the needle, substantially as set forth.

6th, The combination, with the said circuit closing needle, of a plate or disk, in and to which are secured the insulated wires of one or more apparatus for operating the valves which supply the gas to the burners, substantially as and for the purposes described.

7th, The method of closing the circuit of the local battery, by which the circuit closing apparatus is actuated, by connecting the same with the operative works of a clock or other time piece, under the arrangement herein described, so that said circuit may be closed at any desired hour.

8th, The construction and arrangement of the mechanism for closing and breaking the circuit between the operative works of the clock and the battery connected with the magnet of the circuit closing apparatus, substantially as shown and described.

9th, The combination, with the operative mechanism of a clock or other timepiece, of the gas lighting and circuit closing apparatus herein described, the whole being constructed and arranged so as to cause the simultaneous ignition of any number of gas jets at any desired hour, substantially as set forth.

81,736.—PROCESS AND MATERIAL FOR CARBURETING GASES.—John Allen Bassett, Salem, Mass.

I claim 1st, The combination of absorbent materials having different capillary powers, for the purpose of holding hydrodarbon-liquids in suspension in carbonizing air and gases.

2d, Carbureting air or gases by the combined capillary materials described and shown.

3d, The apparatus shown and described charged with the materials specified, and used for the purpose set forth.

81,737.—SHAFT FOR VEHICLES.—Agustus Bean, Fairview, Pa.

I claim, 1st, The shaft, H, provided with a curved extension, I, sliding under the bed of a cart in the guard, J, on the inner side of one of the short shafts, O, and held in position by means of a spring, K, substantially as and for the purposes herein set forth.

2d, The shaft, F, hinged to one of the short shafts, C, and connected, by means of a cross-bar, G, to the shaft, H, substantially as and for the purposes herein set forth.

The combination of the shafts, F and H, when constructed and attached to a cart in the manner described, and operating substantially as and for the purposes herein set forth.

81,738.—MACHINE FOR PRESSING BRICK.—Cornelius Berrian, Clinton city, Iowa.

I claim the combination and arrangement of cap, B, shafts, N and K, pi-man, F, rods, S S, arm, L, and travelling fulcrum, J, when constructed, arranged and operating substantially as and for the purpose herein set forth.

81,739.—TEASLING MACHINE.—Edwin Birkenshaw, Ashuelot, N. H.

I claim the spring, D, and hooks, C C, for holding or attaching the gig-slats B, the teasling-gig cylinder, A, when constructed and arranged substantially as herein specified.

81,740.—FIBER AND GUM FABRIC.—Adolphus F. Boshop, John H. Aiken, Norwalk, Conn., and John M. Pendleton, New York city.

We claim the within described compound of fiber and rubber cement, formed in the proper shapes, and vulcanized, as and for the purposes herein set forth.

81,741.—CAR COUPLING.—Thomas H. Bomar, Atlanta, Ga.

I claim the arrangement of the pivoted arm, D, angular, elevating link, C, stops, E E, inclined plane, A, and pin, B, in the drawhead, G, all constructed and used substantially as specified.

81,742.—CHARCOAL FURNACE.—C. W. Briggs, Springfield, Mass.

I claim, 1st, A charcoal furnace surrounded by the flange, F, and having a smoke flue, C', opening beneath the flange, and an air flue formed by the plate, B, prolonged as described, for the purpose of delivering the air supply at a point near the line of the diameter of the furnace, substantially as described.

2d, In combination with the plate, C, forming the smoke flue, the flanged vessel, A, having the side, G, below the flange flattened, substantially as and for the purpose set forth.

81,743.—APPARATUS FOR RENDERING LARD, TALLOW, ETC.—Amos Broadnax, Mont Clair, N. J.

I claim, 1st, Rendering fat or other oleaginous matter by putting it in a rotating or tumbling chamber, combined in or with a stationary chamber, to which the heat can be applied and regulated, substantially in the manner described.

2d, Rendering fat by putting it in a tumbling perforated chamber, out of which the fat and water can be drained as fast as the melting proceeds, and in which the scrap can be dried, when said perforated tumbling chamber is confined in a chamber which can be heated to the required temperature.

3d, Combining a perforated rendering vessel which can be rotated, and which is confined in a hot chamber, over or in connection with a pan arranged to receive the fat and water set free in the process.

4th, Constructing a covered furnace with radiating flues, substantially as described, in the bottom of a chamber, and arranging in said chamber, and over said furnace, a rendering apparatus, substantially as set forth.

5th, Combining in a chamber to which the heat can be applied, and the temperature regulated, substantially as described, an open rendering kettle, divided by a perforated partition plate in such manner as to form an upper and a lower chamber, making the lower chamber large enough to hold all the grease or oil which can be extracted from a full charge of fat in the upper chamber, leaving the scrap, after the process is completed, on the plate above the surface of the rendered fat.

6th, Removing fat by forcing hot air out of a chamber in which the temperture can be regulated into a digester, by means of a pump, substantially as described.

7th, Rendering fat or other oleaginous matter by drawing a current of hot air into the digester, or upon the fat, out of a chamber in which the temperature can be regulated, by means of a partial or complete vacuum created in the digester through the agency of a condenser and pump, or in any of the well known methods of creating a complete or partial vacuum, substantially as described.

8th, Separating the offensive gases from the condense-water, and destroying the same by passing said condense-water, whether out of an open or surface condenser, through a heater combined or connected with the apparatus, by which the gas is driven out of the water, as it flows from the condenser, into the fire, or is otherwise disposed of, substantially in the manner described.

81,744.—RENDERING AND REFINING LARD, OILS, ETC.—Amos Broadnax, Mont Clair, N. J.

I claim, 1st, The use of steam heater in combination with a steam boiler or generator, and a rendering digester or distiller, and in which the temperature can be regulated, for the purpose of rendering fat or distilling oil by superheated steam or air, substantially as described.

2d, Rendering, refining, or distilling fat or other oleaginous matter by steam or air, superheated in a separate superheater, on its way from the boiler or generator to the digester containing the fat or oil.

3d, Superheating steam or air in a magazine or chamber, C, and carrying said steam or air over into the digester or distiller by a blast or current of steam or air, substantially as described.

81,745.—BAILING PRESS.—Charles Brown, Buffalo, N. Y., and David L. Miller, Madison, N. J.

We claim, 1st, The arrangement of the covering plates, J, connected to the follower, and moving therewith, substantially as herein described.

2d, The arrangement of the removable side, K, of the part, B, of the press box suspended and moving upon the hinged bars, K1 K1, substantially as and for the purpose set forth.

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3d, The combination and arrangement of the friction brakes, I, with the worm shaft, G, and worm wheels, F F, and eccentric rock shaft, H, and its connections, substantially as described.

4th, the hinged partition, L, arranged in the part, B, of the press box, as and for the purpose set forth.

81,746.—DOOR HOLDER.—George C. Bunsen, Belleville, Ill.

I claim the combination and arrangement of the spring dog or lever, H, with the case, F, for operating as a door or window holder, substantially as described.

81,747.—BEEHIVE.—Henry Burton, Richview, Ill.

I claim the hive, B, suspended within, but not in contact with, the base, A, upon legs, B1, which support it above the bench, said parts being respectively constructed and arranged in relation to one another substantially as and for the purpose set forth.

81,748.—JOURNAL BOX.—Alonzo B. Caldwell (assignor to himself and Jacob Pinkerton), Syracuse, N. Y.

I claim, 1st, The knobs or hooks, h h, or their equivalent, as a part of the bronze metal frame, B, substantially as and for the puposes described.

2d, The flanges, f f f, upon the ends of the arms, b b b, when made and applied in the manner and for the purposes described.

3d, The cast iron shell, A, when cast around the heads of the knobs or hooks h h, upon the bronze metal frame, B, in the manner and for the purpose as above described.

4th, The shoulders, s s, upon the bronze frame, B, in combination with the knobs or hooks, h h, and holes, a a, in the cast iron frame, A, when used to hold more securely together and strengthen the bronze metal and cast iron box, in the manner described.

5th, A journal box composed of the bronze metal portion, B, when made with the flanges, f f, and shoulders, s s, combined with the cast iron frame, A, made as aforesaid, with the soft metal portions, m m m, filled in, substantially in the manner and for the purposes described.

81,749.—LAMP.—James Calkins, New York city.

I claim 1st, The divided chamber, consisting of the reservoir, A. and consumption chamber, D, in combination with the duct or coil, C, and water chamber, B, arranged and operating substantially as and for the purposes set forth.

2d, The intervening air-space, G, between the chambers, A and D, as and for the purposes set forth.

81,750.—DEVICE FOR OPERATING WAGON-BRAKES.—Dennis W. Carkhuff, Lambertville, N. J.

I claim a slotted lever, ratchet, pawl, spring, and guard, when made and applied in the form and manner, and for the purposes herein described and set forth.

81,751.—LARD PRESSER AND SAUSAGE STUFFER.—Joseph B. Cassel, Worcester township, Pa.

I claim, 1st, The vessel, C, rendered detachable from the base, A, having a detachable spout, D, and adapted for the reception of a perforated casing, E, and of plungers, I or C, the whole being arranged and operating substantially and for the purpose set forth.

2d, The yoke, G, hinged to the vessel, C, and its spindle, H, and pinion, l, for operating the plunger rod, H', as described.

3d, The combination of the perforated casing, E, and a funnel-shaped ring, hinged to the casing, as and for the purpose set forth.

4th, The plunger, K, attached to the under side of the plunger, I, by a dove-tailed projection, r, or equivalent fastening, for the purpose specified.

81,752.—EVAPORATOR.—B. F. Cauffman, Millerstown, Pa.

I claim the furnace, A, provided with double dampers, c c, and dampers, g e m, in combination with small side furnace, D boiler, F, and pan, H, and the lids, K K, the several parts being constructed, arranged, and used as and for the purpose specified.

2d, The arrangement of the track, d car, E, and windlass, h, with the grate of the larger furnace, A, with the side furnace, D, when operated and used as and for the purpose set forth.

81,753.—ROPE MAKING MACHINE.—Charles Clark, Dayton, Ky.

I claim the arrangement of the hollow journaled revolving frame, E, gravitating friction bars, H H', hangers, G, eyes, L, and orifices, K, triplet, W, positively rotated delivery rollers, N N', for the purpose set forth.

81,754.—WHIP HANGER.—Pindar F. Cooley, Pittsfield, Mass.

I claim, 1st, The notch, n, with the upper curviform-surface line, g, substantially as and for the purpose set forth and described.

2d. The rim, A, constructed circular, square, oval, or any other form, provided with the notches, n n n, as described, and the supporting rods, o o o, or their equivalents, and all in combination with the swivel, C, as and for the purpose set forth and described.

81,755.—COMPOUND FOR EMBALMING DEAD BODIES.—Elliott H. Crane, Burr Oak, Mich.

I claim the discovery, application, and use of an embalming and mummifying compound for the preservation of the dead, and for taxidermie purposes, as prepared, compounded, and applied, substantially in the manner specified and described.

Also, the application of this compound, in dry powder, to the mouth, throat, and other natural apertures of the subject, substantially as specified and described.

81,756.—TRAVELLING TRUNK.—Geert De Bretton, (assignor himself and Joshua E. Vose), New Orleans, La.

I claim, 1st, The combination of part, D, with the trunk body proper, when these parts are united, constructed, and arranged so as to be convertible into a system of shelves, substantially as herein described for the purpose set forth.

2d The above combination in combination with the extra cover, A. when the several parts are united, constructed, and arranged for conjoint operation, substantially as described for the purpose set forth.

3d, The hasp, J, and metallic straps, C, when severally constructed as described, in combination with a trunk provided with a part, D, and an extra cover, A, substantially as herein described for the purpose set forth.

81,757.—AUTOMATIC CRADLE.—Sylvanus G. Delano, Grand Blanc, Mich.

I claim, 1st, The adjusting plates, C, in connection with the cradle body, A, and frame, B, substantially as herein described.

2d, The pivoted plate, E, in connection with the vibrating lever, G, when attached and operating substantially as and for the purposes set forth.

3d, The combination of the above named parts with any suitable clock movement, when arranged, constructed, and operating substantially as described, and for the purposes designated.

81,758.—WHEEL FOR CARRIAGE.—W. H. De Valin, Sacramento, Cal.

I claim, 1st, Using the rim or tire to the hub or axle by means of a series of straps or flat bars of wrought iron, each bent at the middle, where it is attached to the rim, and having its diverging ends extending thence to the hub or axle, to which they are united in the manner set forth.

2d, The combination, with the elongated hub, and the axle upon which it is mounted, of the rim or tire, and a series of wrought iron straps or flat-bars, for steadying and bracing the said rim, and for holding the same to the hub, the whole being arranged in the manner set forth.

81,759.—COAL MINING APPARATUS.—George Edmund Donisthorpe, Leeds, England. Patented in England, April 28, 1868.

I claim the combination, in mining machinery, of the traveling carriage that carries the mining mechanism, with a yielding pressure wheel, which, while pressing the said carriage upon its track and preventing its rise, permits it to be moved forward without relaxing the pressure, the combination being substantially as set forth.

Also, the combination and arrangement of the said traveling carriage, that carries the mining mechanism, with an air cylinder, to apply the pressure required to hold the said carriage upon its track, substantially as above set forth.

81,760.—COAL MINING APPARATUS.—George Edmund Donisthorpe, Leeds, England. Patented in England, May 22, 1861.

I claim the combining with a carriage (capable of being moved by mechanism slowly along the face of the coal or mineral), a cutting tool, which is so supported and guided that a reciprocating to-and-fro motion may be imparted to it by the power of the workman, substantially as herein described.

81,761.—MACHINE FOR TURNING RODS.—Frank Douglas, Norwich, Conn.

I claim, 1st, The arrangement of the inclined cross cutting knife, e, with the knives, e' e'', in a tubular cutter head, when constructed and operating substantially as and for the purpose above described.

2d, The guide, f', when constructed with the openings, m m, and the notches, n n, and operating in connection with the lock, o, and the tubular cutter head, substantially as and for the purpose set forth.

3d, The arrangement of the grooved rollers, R R', at the rear end of the cutter spindle, substantially as described.

81,762.—REVOLVING FURNACE FOR ROASTING ORES.—Frederick Ernst, San Francisco, Cal.

I claim, 1st, The hearth, D, revolving between the inner and outer walls, B C, of the furnace, with the circular rack, F, and flange, G, operating in the grooves of the rollers, H H, substantially as described.

2d, The discharging apparatus, operating traversely across the furnace, above the rotating hearth, and consisting of the scrapers, N N, attached to the endless chain, N', operated by the wheels, substantially as described.

3d, The construction of the hearth, D, with the circular flange, E E, so as to retain the ore upon the surface of the hearth, and the stirrer, M, or its equivalent, to turn the ore as the hearth revolves, the whole constructed and operated substantially as described.

4th, The dampers, U U', and sliding plate, S, arranged to be operated substantially as and for the purposes described.

5th, In revolving furnaces, carrying the ore in one direction on the hearth, while the heat, flame, and gases pass in an opposite direction, substantially as described.

81,763.—ROTARY STEAM ENGINE.—Nelson B. Fassett (assignor to himself and William Humphrey), Adrian, Mich.

I claim, 1st, The two steam backers, S and S', in combination with their respective radial pistons, P and P', constructed and operating in the manner substantially as set forth and described.

2d, The circular disks, j and k, in combination with the radial wings, a, b, c, and d, shaft, T, and rings, 1 and 1', constructed in the manner set forth and described.

3d, The combination of the convex faced bar, f, and concave faced bar, f', for packing against the concave case, B', and rotary piston, R, respectively in the manner set forth and described.

4th, The combination of the slot wheel, L, with the crank arm, K, friction roller, z, and stop wheel, M, constructed in the manner set forth and described.

5th, The steam channel, m and m' or m'', in combination with rotary piston R, and center piece, G, respectively, as set forth and described.

81,764.—VISE.—Isaac Fisher, St. Louis, Mo.

I claim the combination of the steel facings, b b, with jaws, a a, of a vise, and the soft metal clamps, x x, substantially as shown and described.

Also, the combination of the rectangular facings, c c, with the vise jaws, a a, by means of the removable blocks, d d, fig. 2, substantially in the manner and for the purpose herein set forth.

Also, the arrangement of the pivot connection of the triangular block, j, with the removable block, d, when the said blocks are combined with one of the jaws, a, of my improved vise, substantially as and for the purpose herein set forth.

81,765.—POTATO DIGGER.—Elias T. Ford, Stillwater, N. Y.

I claim, 1st The dividers, E E, with the tubes. H H, shafts, J J, armed with teeth, Q Q Q, arch, T, draft bars, V V, in connection with lugs, r r, braces, L e L e, the shafts, F F, hinged to axle, B, with tubes, G G, the adjustment of the dividers, E E, varying the line of draft with pole section, B r, the section, b b, hinged to centers, d d, the position of the separating teeth, Q Q Q Q, underneath the dividers, E E, and the open space, W, between, substantially as described.

2d, The pole section, B r, hinged to the lugs, r r, underneath, and in rear of the axle, B, in combination with the dividers, E E, the lugs, r r, to be adjustable, in the manner and for the purpose specified.

3d, The vine cutter, o o, with knives, S S, plane or sickle edge, as hinged with swivel, U, underneath the pole sections, B r, substantially as and for the purpose specified.

81,766.—RECIPROCATING STEAM ENGINE.—Alexander Caesar, Frederick Franklin, No. 4 Princes Square, Bayswater, England.

I claim my improved engine, constructed substantially as described, that is, with each cylinder open at one end only to the atmosphere, and with the cranks of the driving shaft and the connecting rods of the pistons of such engines arranged to project from the shaft in the manner herein described.

81,767.—APPARATUS FOR AMALGAMATING GOLD AND SILVER. Willard M. Fuller, Chicago, Ill. Antedated August 28, 1868.

I claim, 1st, Discharging the tailings of an amalgamator through a conduit or outlet, the mouth of which is immersed in liquid, so that it will close such conduit against the admission of air, and at the same time afford a free and uninterrupted passage for the tailings, substantially as specified.

2d, The steam jacket, D, in combination with the kettle or vessel, C, and shell or case, B, substantially as described.

3d. The shell or case, B, when provided with pipes, E, L, and A, so that it can be operated interchangeably, either by water or by exhausting the air, substantially as specified.

4th, Placing the kettle, C, within an air tight case, B, so as to leave an annular space or flues between them, and connecting such space or flues with a discharge pipe, E, placed below, substantially as specified.

81,768.—CARRIAGE SHACKLE.—Wm. F. Gilbert, Derby, Conn.

I claim the combination of the sleeve or bearing, D, arranged between the cheek, A and B, and secured by the bolt, E, with the head, G, of the thill iron, the whole constructed so as to be united substantially as herein set forth.

81,769.—DRILL.—Frank Glasser, Mystic Bridge, Conn.

I claim the adjustable lever, attached to the drill stock, as described, and consisting of the pivoted handle, G, screw, E, and fixed arm, D, all operating as set forth.

81,770.—FLOUR DREDGE.—E. A. Goodes (assignor to himself E. L. Miller, and W. H. Morford), Philadelphia Pa.

I claim the flour dredge, B C, so constructed that its perforations may be entirely closed, or a greater or less number be uncovered, substantially as shown and described for the purpose set forth.

81,771.—FENCE-POST DRIVER.—William S. Graves, Oberlin, Ohio.

I claim segmental stay, D, and slotted rail, E, as arranged, in combination with the ways or guides, b, and frame, C, for the purpose specified.

81,772.—POTATO DIGGER AND SEPARATOR.—William Green, Holly, Mich. Antedated Aug. 28, 1868.

I claim, 1st, Simultaneously adjusting the plow, and putting the apparatus into or out of gear with its driving wheels, by means of the sliding frame, E E', and axle, D, when operating together for that purpose, substantially as described.

2d, The conveyer, G, in combination with the shovel, E, substantially as and for the purpose set forth.

3d, The use of the two rollers, H H', for the purpose of detaching and separating the potatoes from the vines, substantially as described.

4th, The combination of the conveyer, G, cords, I I, and rollers, H H', substantially as and for the purpose set forth.

81,773.—MACHINE FOR STRETCHING HAT BODIES.—W. C. Griswold, Brooklyn, N. Y.

I claim the combination of the tip-stretching mechanism, consisting of the spokes, c', and star, m, with the brim-stretching mechanism, consisting of the inclined stationary arms, d', and the expansible or spreading arms, i, all constructed, arranged, and operating substantially as herein specified.

81,774.—MACHINE FOR POLISHING WOOD.—Stinson Hagaman, Weissport, Pa.

I claim the loose sleeve, i, set screw, j, nut, k, and slide, l, in combination with the shaft, E, and treadle, M, operating substantially as described, and for the purpose specified.

81,775.—MAKING IRON.—Alexander Hamar, New York city.

I claim, 1st, The method, herein described, of introducing steam, superheated steam, or hydrogen, into the boshes of a blast furnace above the ordinary blast tweers, for the purpose set forth.

2d, The method, herein described of introducing steam, superheated steam, or hydrogen, into the stack of a blast furnace, for the purpose set forth.

3d, The method, herein described, of producing iron suitable for conversion into steel by the use of anthracite and a hot blast, in combination with the introduction of hydrogen or superheated steam into the furnace at different elevations.

4th, The combination, substantially as set forth, with a blast furnace, of tweers, arranged at different levels in the boshes and stack, for the purpose set forth.

5th, The combination, substantially as set forth, with the furnace, of the jet pipes intruding into the interior of the boshes and stack, as and for the purpose set forth.

81,776.—PLANING MACHINE.—S. M. Hamilton, Baltimore, Maryland.

I claim the vertically moving guide, H, constructed and arranged substantially in the manner and for the purpose shown and described.

81,777.—HEEL PLATE FOR BOOTS AND SHOES.—W. E. Hamlin, Jr., Providence, R. I.

I claim the improved heel plate for boots and shoes, consisting of a plate made in two parts, A and B, constructed and fitted to each other so as to accommodate heels of different sizes, in the way substantially as described.

81,778.—SUBMERGED ROTARY PUMP.—D. D. Hardy (assignor to T. H. Foulds), Cincinnati, Ohio.

I claim a pump, consisting of the case, F, with the pistons, G, inclosed therein, connected by the pipe, C, with the hydrant, B, and operated by the rod, H, all substantially as described.

81,779.—LOCKING LATCH.—J. Hardy, 2d, Andover, and B. B. Floyd, Lawrence, Mass.

We claim a latch provided with the eccentric button, F, when arranged within the space, h, as illustrated, and operated either by removable key or retained knob, J, substantially in the manner and for the purposes specified.

81,780.—GRINDING MILL.—Edward Harrison, New Haven, Conn.

I claim, 1st, The husk or runner case, A, constructed in one and the same piece, with discharge spout, B, frame, C, connections, D, bearings, E and F, sockets, H H, substantially as set forth.

2d, Fitting hopper, N, into sockets, H, in the manner described, when said sockets are a part of one of the husks of the mill.

3d, The rocker, P, pivoted to the husk, and so as to be operated by an eccentric or cam, S, on the pulley or shaft, substantially as and for the purpose specified.

4th, A double-faced stove, provided on its edge with a central flange, L, when the surfaces of the said flange bear the relative position to the face of the stone as described, so as to be set and adjusted to present either face of the stone in the same relative position to the grinding surface of the other stone, substantially as and for the purpose specified.

5th, In combination with the subject-matter of the above fourth clause, the runner plate or bed-stone husk, constructed so as to receive the stone, substantially as and for the purpose specified.

81,781.—TUBULAR AIR HEATER.—B. R. Hawley, Normal, Illinois.

I claim the diaphragm, B3, when perforated at b2, and otherwise arranged, as herein shown and described.

81,782.—MITER BOX.—W. H. Herbert, Blissfield, Mich.

I claim, 1st, The oscillating bar, R, when constructed and operating substantially as and for the purposes herein set forth.

2d, An adjustable mitre box, consisting of the two quadrants, D and L, frame, C, set screws, G M and P, the road, J, guards, K, saw guides, N, and oscillating bar, R, when arranged and operating substantially as herein described.

81,783.—DEVICE FOR BINDING LOADS OF HAY UPON WAGONS.—J. W. Hodges, Plymouth, Ill.

I claim the combination of the two upright rack bars, B B, the horizontal beam, C, its pawls, g g, with the lever, D, its fulcrum, h, with the rack, A, all constructed and operating as herein set forth.

81,784.—VENTILATOR FOR HAT.—W. M. Irvine and A. H. Moses, Montgomery, Ala.

We claim, 1st, A band or ring so constructed and arranged on the inside of a hat that it may be adjusted to different-sized heads, substantially as described.

2d, The band, A, constructed in either one or more parts, and furnished with tubes, e and a, slots, C, and tube, E, all arranged in the manner and for the purposes set forth.

81,785.—APPARATUS FOR EXTRACTING WORT AND SIMILAR LIQUIDS.—F. Jacoby, St. Louis, Mo.

I claim, 1st, The application of a partial vacuum in the sub-compartment of a mash tub, to cause the wort to accumulate more quickly, and to cause its extraction more thoroughly out of mash, substantially as set forth.

2d, The combination of the pump, E, its connecting pipe, D, with the concentrating head, C, and the drain pipes, B, and mash tub, A, substantially as and for the purpose set forth.

81,786.—WHIP HOLDER.—Albert W. Johnson, New York city.

I claim, 1st, A holder for whips, etc., composed of jaws, B, in combination with a rest, M, or their respective equivalents, connected together so as to be operated and to operate substantially in the manner described.

2d, The jaws, B, sleeves, E F, center-shaft, G, spring, O, and rest, M, when all constructed and arranged together for operation substantially as described.

81,787.—HARNESS MAKERS' CLAMP.—Jesse F. Johnson, Monrovia, Ind.

I claim, 1st, The guide plates, C, attached to the jaws, A A', substantially as and for the purpose set forth.

2d, The holding bar, E, lever, G H e, and elastic strap, I, arranged substantially as and for the purpose set forth.

3d, The channeling tool, L, constructed and applied substantially as set forth.

81,788.—HARNESS.—W. A. Jordan, New Orleans, La.

I claim a metallic connecting termination or tip for certain parts of harness, as herein indicated, when the same consists of the self-fastening, annular tapering socket clamp, A, and a projecting loop, B, and is otherwise constructed substantially as herein described for the purpose set forth.

81,789.—ESCAPEMENT.—W. C. Kellum, San Francisco, Cal.

I claim, 1st, The escape wheel, C, having escape teeth either on the side or rim, and the notched impulse rollers, D and D', above and below, constructed and operating substantially as and for the purpose herein described.

2d, The detent lever, F, with the adjustable double-headed screw, c c', or its equivalent, locking each tooth of the escape wheel twice at each revolution, either by spring or gravitation, substantially as herein described.

3d, The point, d, on the arm, G, and the point, e, on the roller, D, for unlocking, substantially as herein described.

81,790.—SEEDING MACHINE.—G. King and L. T. Shope, Frederick City, Md.

We claim hinging the lower section of the seed spouts, P V, to the tubes or spouts, R M, as and for the purpose specified.

81,791.—HAY RAKE.—Watson King, Springfield, Ill.

I claim, 1st, The rotating of the axle, A, by means of the gearing, C B and D, herein described, whether spur or beveled, as applied to hay rakes.

2d, The lever, B C, as shown in fig. 2, as applied to hay rakes.

3d, The collar, F, in combination with the geared lever, B and C, as herein arranged and described.

4th, The tooth, as constructed in fig. 4, in combination with the adjustable brace, L, and nut, M.

5th, The adjustable brace, L, as herein arranged and described.

81,792.—CAM FOR OPERATING SHUTTLE BOX.—C. H. Knowlton, Camden, N. J., assignor to Furbush & Gage, Philadelphia, Pa.

I claim, 1st, In a drop-box loom, the within described system of ratchet wheels and cams adapted to each other, carried by one spindle, and arranged to be operated and to operate substantially as and for the purpose herein set forth.

2d, The friction clamps, T, in combination with the cams which operate the drop boxes of looms.

81,793.—BURNING KILN.—Balthasar Kreischer, New York city.

I claim, 1st, The arrangement of passages, E F, controlled by dampers, m, substantially as herein described, for carrying off the gases and products of combustion, through the doorways, C, of the kilns, and openings, e f d, controlled by dampers, g and j, communicating with an adjoining kiln or lower flue, D, as required

2d, The top flues, F F, in combination with the hollow doorways, C, and connecting tubes or passages, E, essentially as herein described.

3d, The double arch, G, to the kilns, in combination with the openings or tubes, H, and chamber or passages, p. made in the side walls of the whole structure or fire-end of either kiln, and connecting with the grate or fireplace as herein set forth.

4th, The bottom flue, D, arranged below the floor of the kilns, and transversely to them, in combination with the branches running to or from each kiln, in direction of the length thereof, and connecting, by suitable openings, the kilns at their ends or doorways. C, with either smoke stack, and controlled by suitable dampers, substantially as and for the purposes specified.

81,794.—MACHINE FOR SEPARATING ORES.—S R. Krom, New York city. Antedated Aug. 5, 1868.

I claim, 1st, Introducing the material upon the bed, I, in a thin stratum, close to the surface of the bed, substantially in the manner and for the purpose herein set forth.

2d, Traversing the material across the perforated bed. I, transversely to the length of the machine, that is to say, extending the bed, I, longitudinally of the length of the framework, A, and causing the material to traverse across its narrowest dimensions, substantially as and for the purpose herein set forth.

3d, The roller, L, arranged and operating as represented relatively to the discharge passage, J, for the purposes herein set forth.

4th, The trip wheel, C, and lever, F G, or their respective equivalents, arranged, relatively to the bellows, D, and to the perforated bed, I, and its connections, as and for the purposes herein set forth.

5th, In combination with the perforated bed, I, and with the means for introducing and removing the material as specified, mounting the bellows, D, on a rocking shaft, S, and operating it by an adjustable vibrating motion, substantially as and for the purposes herein specified.

6th, The gates, N and K, so arranged as to allow the separate or simultaneous changes in the thickness and velocity of the strata on the ore bed, I, substantially as and for the purposes herein set forth.

7th, In combination, the ore bed, I, with its feeding and discharging devices, the adjustable oscilating bellows, D, the trip wheel, C, and its connections, and the means, H H1 H2, or their equivalents, for varying the rate of discharge through the passage, S, all arranged for joint operation, substantially as and for the purposes herein set forth.

8th, The within-described arrangement of the operating parts, C F, and their connections, at the end of the main frame work, A, so that they may operate by a direct connection through the rocking shaft, S, with the bellows, D, and that the closed end of the frame, A, shall form one entire side of an enclosing case to protect the working mechanism, all as and for the purposes herein set forth.

81,795.—PLANE FOR CUTTING BLIND SLATS.—Carl Kupfer, (assignor to himself and Kund J. Fleischer). Madison, Wis.

I claim, 1st, The bit, A, when constructed with sharpened upper and lower edges, 1 and 2, leaving two lips, 3 and 4, said lips to be at right angles with the upper and lower cutting edges, substantially as and for the purposes set forth.

2d. The combination of the bit, A, as described and claimed, with the plane stock, for the use and purposes specified.

81,796.—HORSE SHOE.—Benjamin Ladd, Ottumwa, Iowa.

I claim 1st, Making the inside face of the clip, where it joins the top face of the shoe, in a line with or even with the outer edge of said top face, substantially as described.

2d, In combination with the clips arranged as above claimed, one or more spurs on the top of the shoe, substantially as described.

3d, The shoe, as above described provided with nail holes, as a means of fastening it on, if the clips, or some of them, get broken off.

81,797.—CONSTRUCTION OR ARCHES, TUNNELS, &c.—George T. Lape, Summit N. Y.

I claim, 1st, The construction of sections or voussoirs, with horizontal dove-tailed tongues and grooves along their abutting ends, substantially as and for the purpose specified.

2d, In combination with said dove-tailed tongues and grooves, constructing said voussoirs or sections with rebates along their abutting sides, so that they will lap over each other at their joints or points of contact.

3d, The construction of sewers, aqueducts, and arches for bridges, culverts, tunnels, &c., by combining and abutting or securing to each other a series of sections or voussoirs, substantially as and for the purposes herein set forth.

81,798.—ANIMAL TRAP.—H. S. Lesher, Galesburg, Ill.

I claim, 1st, The tilting platform, g, so arranged in combination with the trigger, i, and spring, m, that when the animal presses the platform down, it is retained in position to prevent its escape.

2d, The hinged plate, R, so arranged in combination with spring, m, trigger, i, and tilting platform, g, that when the animal seeks escape over the plate, R, the tilting platform will be liberated, thus allowing it to fall to its original position.

81,799.—SULKY PLOW.—J. B. Lewis and J. E. Udall, Concord, Ill,

We claim, 1st, The flanges, G, eccentrics, I, wrist pins, J, and pins, L, when constructed, arranged, and operating substantially as herein described, and for the purposes set forth.

2d, The compound lever, M, when constructed, arranged, and operating substantially as herein described, for the purpose specified.

3d, The combination and arrangement of the above-named parts with the frame, A, axle, B, bolt, H, seat, C, traction wheels, K, plow beam, D, plow, E, and quadrant, N, substantially as and for the purposes specified.

81,800.—WAGON BODIES.—Thomas E. Lewis, Pennville, Ind.

I claim a wagon body constructed and operating substantially in the manner described.

81,801.—WELL TUBE.—Lorenzo Lovejoy, Malden, Mass.

I claim the combination, with a well tube, of a series of curved or bent perforated tubes, when constructed, applied, and operating substantially as and for the purpose set forth.

81,802.—RESERVOIR FOR COOKING STOVE.—Albert Lyman, Troy, N. Y.

I claim a metallic reservoir, constructed in the manner described, in combination with sliding covers, all arranged and for the purposes substantially as set forth.

81,803.—FLOORING CLAMP.—Donald D. Mackay, Whitestone, N. Y.

I claim, 1st, The levers, A, pivoted together as at a, and furnished at their lower ends with adjustable fulcrum stems, c, having spurs, c', substantially as shown and described, for the purpose specified.

2d, The combination of the tripping lever, m, with the pusher block, B, the toggle brace, g g*, and the levers, A, substantially as and for the purpose specified.

3d, The arrangement of the pivots, e, of the pusher block, the slots, d, in the levers, A, and the springs, f, substantially as and for the purpose herein set forth.

4th, The arrangement of the ring, b, at the upper ends of the levers, A, carrying the pusher block, B, and toggle brace, g g*, substantially as and for the purpose specified.

81,804.—CHECK VALVE FOR PUMPS.—William R. Malone, Mason, W. Va.

I claim the valve seat for check valves provided with the conical form from A to B, and the taper prolongation provided with the opening in the side and with the stem and valve, constructed and arranged substantially as and for the purpose specified.

81,805.—HINGE.—Thomas D. McCall and Samuel Bushnell, Walton, N. Y.

We claim the clasp hinges, s s and n n, with their joints, a. and the revolving cylinder, e with its grooves, g g, when constructed, combined, and arranged in the manner and to operate substantially as described.

81,806.—PUMP.—Theodore J. McGowan, Cincinnati, Ohio.

I claim the "vacuum" chambers, b b', when cast or otherwise formed upon the valve chest, substantially as herein described for the purpose specified.

81,807.—CULTIVATOR.—D. McNeeley and C. J. Cady, Spurgeon, Ind.

We claim, 1st, The combination of the draft beam, A, with plates, J J, slots and set screws, s s', and wheel, D, substantially as described.

2d, The arrangement of the beam, A, handles, B B, wheel, D, plows, E E E, standards, C C1 C2, cross beam, L, braces, K o o' o'', and attachable and detachable rake, F, substantially as shown and described.

81,808.—MOTH FLY TRAP FOR BEE HIVES.—James D. Meador, Independence, Mo.

I claim the tongued floor, B, in combination with an illuminating floor, D all arranged and employed as herein described and set forth.

Also, the several parts, A a B b D, and the covered way, c, when constructed and combined as herein shown and described.

81,809.—HOT AIR FURNACE.—Martin Metcalf, Grand Rapids, Mich.

I claim, 1st, The pipes, R, or their equivalents, when arranged with a drum, D, and extending downward as described, and for the purpose specified.

2d, The combination of a case, A, provided with passages, x, and a box, B provided with a projecting flange, f, and slots, x, with the pipes, R, and th

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drum, D, when constructed and arranged substantially as and for the purpose herein set forth.

81,810.—CHURN.—John L. Middleton, Zanesville, Ohio.

I claim the churn, A, having an opening, G1, constructed as described, in combination with the metallic lid, G, locking bar, H, screw, g, and handle, knob, or button, g1, substantially as and for the purpose set forth.

81,811.—SAW.—Warren P. Miller, New York city.

I claim, 1st, The shoulder, d, on tooth, b, and rest, c, on saw-plate, A, when constructed and arranged to operate in the manner and for the purpose substantially as described.

2d, A detachable saw-tooth, in which is combined a circular shank adapted to a circular recess in the saw plate, and having shoulder, d, adapted to abut against rest, c, on the saw plate as described.

81,812.—SAW.—Warren P. Miller, New York city.

I claim a saw, with the teeth, c c, in pairs on base, e, having parallel sides, and deep spaces, d, between the pairs of teeth, constructed and arranged to operate in the manner and for the purpose described.

81,813.—SLIDING GATE.—George Motter, Jr., Henry, Ill.

I claim, 1st, The gate constructed with the triangular brace of its rear end, and having the rollers, d d, applied so as to bear upon opposite sides of the rail, a', and being held thereon by the projections, e, in combination with the posts, A and A', with the roller, C, all arranged to operate substantially as herein set forth.

2d, The stationary hooks, F and G, constructed and applied as shown and described.

81,814.—WINE COOLER.—Julius Nuellens, Torquay, and Matthias Neuhaus, London, England. Patented in England, May 29, 1868.

We claim, 1st, Constructing or providing portable coolers or cooling apparatus with a water tight cover, substantially in the manner and for the purpose herein described and shown.

2d, The combination, within the case, a, of the series of divisions, c, forming apartments and otherwise supporting the ring, b, substantially as and for the purpose described.

3d, The elastic diaphragm, g, with central opening, h, and overlapping edges, in combination with the plate, i, and suitable fastening devices on said plate and the case, a, substantially as and for the purpose described.

81,815.—WATER PROOF CLOTH.—Alfred Paraf, New York city.

I claim, 1st, As a new article of manufacture, the water proof mixture, compounded and prepared substantially as before set forth.

2d, The manufacture of water proof fabrics, by applying the water proof mixture before described upon textile fabrics, substantially in the manner before set forth.

81,816.—WINDMILL.—Walter Peck (assignor to William Jobes, Seth H Hills, and Amelia C. Peck), Rockford, Ill.

I claim, 1st, A bounding piece, arranged to operate for controlling the speed of a windmill, substantially as described.

2d, The combination of a bounding piece, for controlling the speed of a windmill, with a weighted extensible lever, substantially in the manner described.

3d, The collar, m, when supported by the shaft, n, and held by the ratchet and pawl, n', and operated by pulley and cord, or band, and when in combination with the weighted lever K, all as and for the purpose set forth.

4th, The ratchet on arm, q, in combination with its spring pawl, when the pawl moves in guides, and is held by the drop catch, s, substantially as and for the purpose set forth.

5th, In combination with the latch, connected as described, the sliding piece, t, with its pin, l', moved and operated substantially as and for the purpose set forth.

81,817.—BRIDGE.—Andrew J. Post, Hudson City, N. J.

I claim the castings, M m, fitted in the top chord, as specified, and extending up to the upper surface thereof, having inclined surfaces forming fair bearings for the struts on the diagonal ties, and recesses at the base adapted to receive the round ends of the struts, B, all constructed, combined, and arranged substantially as and for the purposes herein set forth.

81,818.—EAVES TROUGH.—John Reinig, Fond Du Lac, Wis.

I claim the construction of a hanger, for the purpose described, when constructed of one piece of metal, bent in such form as to conform to the shape of the eaves trough, and provided with bolt and nut, G, substantially as herein described and set forth.

81,819.—MECHANICAL MOVEMENT.—Ed. O. Rood, Lodi, Ill.

I claim the vibrating lever or bar, H, or its equivalent, applied to a rock shaft, F, in the manner described, and employed in conjunction with two circular series of teeth or projections, e, substantially as and for the purpose set forth.

81,820.—FARM GATE.—John Root, Cass Co., Mich.

I claim, in combination with the sliding gate, B, the eccentric wheel, H, and revolving post, E, all arranged and operating in the manner and for the purpose set forth.

81,821.—SEWING MACHINE.—A. S. Rowley, Hudson, N. Y.

I claim, 1st, The combination and arrangement of the two cams, C C', the rods, c d e, and series of hooks, b b b, etc., substantially as and for the purpose set forth.

2d, The combination and arrangement of the angular box or hopper, E, the spiked, toothed, or corrugated cylinder, F, endless apron, D, and holding and feeding fingers, s s s, etc., substantially as and for the purpose herein set forth.

3d, In combination with the above, a sewing mechanism substantially as and for the purpose described.

81,822.—INJECTOR FOR STEAM GENERATORS.—Samuel Rue, Jr., Paoli, assignor to himself, Samuel Mc. Cambridge, and Edward G. Martin, Philadelphia, Pa.

I claim, 1st, The arrangement of the adjustable intermediate pipe, H with the plugs, D and D', when said parts are provided with the valves, L and L', and the valve seats, a and a', substantially in the manner hereinbefore described.

2d, The arrangement of the adjustable pipe, H, being smaller at its receiving end than the front end of the steam pipe, whereby to increase the pressure upon the water through the former, substantially as specified.

3d, The diminished bore of the pipe, H, for effecting a greater pressure at its receiving than at its discharging end, whereby to resist the check of the check valve, between the injector and the boiler, substantially as described.

4th, The combination of the air and water chamber, K, with the injector, opposite the feed pipe, whereby to facilitate the supply of water to the injector at the commencing of its flow, substantially as described.

81,823.—BELTING.—Thomas Standring, Fort Richmond, N. Y. Antedated July 6, 1868.

I claim, as a new article of manufacture, the belting, consisting of the solid sheet of steel, a' clamped between the leather parts, a e, by the central rivets, R, and prevented from loosening by being cemented to such parts, as herein shown and described.

81,824.—MEAT-CHOPPING MACHINE.—Sigmund Rutschman, Philadelphia, Pa.

I claim the combination, with the cross-head and sliding boxes of a meat-chopping machine, of flanges, a a, permanently secured to the cross-head and of the pins, f f, inserted through the said flanges and the sliding boxes, substantially as and for the purpose herein specified.

81,825.—REEL.—Albert H. Saunders, Nashua, N. H.

I claim the reel, made with the hub in two parts, a' b', connected by a spring, as described, and having a pair of arms extending from each of the said parts, a' b'.

Also, the reel, as made with the self-adjusting radial arms, and with the hub formed in two parts, a' b', connected by a spring, and having a pair of such arms extended from each of the parts, a' b', as specified.

81,826.—WARP DRESSER.—Benjamin Saunders, Nashua, N. H., assignor to himself and Albert H. Saunders.

I claim, in a dresser-frame, the combination of the counterbalance with the brush-frame, its operative cranks and pulleys, as described.

81,827.—WATER COOLER AND REFRIGERATOR.—Charles C. Savery, Philadelphia, Pa.

I claim the combination and arrangement of the enameled ice and water tank C C P and its lid, L, with the enameled air chamber, C'' C'', and its door, D, constructed substantially as herein specified.

81,828. CARRIAGE WHEEL.—George Seymour, Whitney's Point, N. Y.

I claim the combination and arrangement of the stationary key, D, with the wheel turning the axle box, E, adjustable thimble nut, F, and movable rings, B B, all being constructed substantially as herein described and represented, for the purpose set forth.

81,829.—ANIMAL TRAP.—Jeremiah Sherman, New Oxford, Pa.

I claim the combination of the bridge-ways, m, in the side boards, b, the inclined side boards, c, and overlapping boards, h, with the passage, A*, pivoted gates, C, and cage, A, all arranged substantially as shown and described.

81,830.—FEEDING NAIL PLATE.—Winslow Sherman, New York, and Jacob Russell, Brooklyn, assignors to Jacob Russell, Henry T. McCoun, James L. Romer, and Thomas T. Buckley, Brooklyn, N. Y.

We claim, 1st, The arrangement of the feed plate or frame, A, bars, B, socket pins, a a, or their equivalents, and the frame of the machine, in the manner and so as to admit of the feed plate being swung to one side and out of the way of the machine without detaching it therefrom, substantially as specified.

2d, The combination, with the frame of the machine and the feed plate or frame, A, of the bar or bars, B, removable socket pins, a a, and horizontally and vertically-adjustable brackets, C C, all for operation together and in connection with adjusting screws, or their equivalents, to facilitate the adjustment of the feed plate or frame in various directions, and to admit of its being swung to one side or back, essentially as herein set forth.

3d, The combination, with the feed plate or frame, A, and horizontally oscillating bed, G, of the nail-plate adjusting levers, R R, stops, s s', and springs, m m', operating automatically to insure uniformity in the sizes of the heads to the cut blanks, substantially as specified.

4th, The combination, with the bed plate or frame, A, and cutters, S S', of the spring clamp, T, and pin, X, on the cross-rocking beam, H, operating to hold the nail plate during the intermissions to its feed, and to relax hold thereof whilst being fed, essentially as specified.

81,831.—FLOUR BOLT.—H. N. Shultz, Sabillasville, Md.

I claim the combination of the cam wheel, B, upon the end of the flour bolt, with the lever, C, and adjustable stop, m, operating as described, whereby, as the bolt rotates forward, the stop holds the lever firmly in place, and as it rotates backward it allows the lever to swing out of the way, substantially as described, for the purpose specified.

81,832.—HARVESTER.—A. B. Smith, Rochester, Pa.

I claim the construction of the drag bar of two light bars, D D, connected by bolts, a a c, which also serve as pivot connections respectively with the frame, A, "false shoe," E, and shoe, T, substantially as and for purpose herein specified.

Also, pivoting the drag-bar to the shoe, T, forward of the finger bar, G, the forward end of the shoe being adjustable in hight by the screw, i, or its equivalent, while the rear end has a free sliding movement on the "false shoe," E, under the keeper, w, substantially as herein set forth.

Also, the "false shoe," E, constructed and arranged as set forth, in combination with the drag bar, D D, shoe, T, and the finger bar, G, substantially as and for the purpose herein specified.

Also, the spring, u, in combination with the lever, R, vibratory arm, S, sliding pinion, l, and the clutch wheels, m n, or their equivalents, substantially as and for the purpose herein specified.

Also, the spring, u, applied to the coupling bar, substantially as and for the purpose specified.

81,833.—ENDLESS PLATFORM FOR CHURN POWER.—A. B. Smith, Rochester, Pa.

I claim the metallic braces, or cleats, C C, applied to the endless platform, substantially as and for the purpose specified

81,834.—BRAID.—J Hunt Smith, Norwich, Conn., and William Shedlock, and Alfred Shedlock, New York city.

We claim the new and improved manufacture herein described of a tri-radiate braid, or braid composed of three radial members, united to each other by interlocking or interbraiding the threads of the different members with each other, substantially as herein described.

81,835.—BREAST-PIN FASTENING.—Thomas W. F. Smitten, Brooklyn, N. Y.

I claim a guard or bridle, embracing the tongue near the joint, in combination with the body and tongue, substantially as described, whereby the breast-pin or brooch is securely held, and prevented from being lost by the wearer, should the rivet pin of the joint come out.

81,836.—FENCE.—Jacob Southwick, Brant, N. Y.

I claim a portable board fence, when constructed as described, the fence posts, A A, being formed of two pieces, locked together near the top, and spreading at the bottom, and the panels each consisting of boards, B B, confined together by strips, C C, and hung on the fence posts, A A, the whole being secured by pins, a a, and stakes, E E, substantially as herein set forth.

81,837.—HEAD BLOCK.—E. H. Stearns, Erie, Pa.

I claim, 1st, In head blocks for saw mills, the employment of springs, so applied that when the knees are released from the setting mechanism, the springs will automatically bring back the knees to the required position for the next advancing movement, substantially as set forth.

2d, The segment bars, L, constructed, arranged, and applied in the manner shown, or in any equivalent way, for the purpose of limiting the backward movement of the knees, as set forth.

3d, The elastic stops, P, upon the knees of the head block, in combination with the segment bars, L, substantially as described, for the purpose specified.

4th, The flanges, T, for the purpose of carrying and adjusting the dogs, when disengaged from the log or remnant thereof, substantially as described.

81,838.—COMPOSITION FOR ROOFING.—Benjamin Stevens, Wheeling, W. Va. Antedated August 3, 1868.

I claim the compound of coal tar and pulverized slag, as and for the purpose described.

81,839.—GARDEN HOE.—Luther Streeter (assignor to himself and Ransom Shepard) Chicopee, Mass.

I claim, in combination with the blade, A D, of a field hoe, which is more or less curved in the direction of its length, the forked shank terminating in a single socket or tang for the handle, and applied to the blade as set forth, the whole constructed and arranged substantially as described.

81,840.—WATER-HEATER FOR STEAM-GENERATORS.—James W. Sutton, Detroit, Mich.

I claim, 1st, The air space within the jacket, G, when connected with the annular air space, F, and operating substantially as and for the purposes herein set forth.

2d, The combination of the above-named parts, with the boiler, A, water pipes, L check valves, M, three-way cocks, N, stationary connections, O, and escape pipe, P, when arranged, constructed, and operating substantially as and for the purposes herein specified.

81,841.—MACHINE FOR CLEANING FEATHERS.—Thomas Taylor, Washington, D. C.

I claim, 1st, The combination of cylinder, A B C D, supported and revolving on the center cylinder, S S, in the manner substantially described and set forth.

2d, The cylinder, S S, constructed as set forth, being of two compartments, and operating with the valves, x x, in the manner described.

3d, The mode of keeping the valves open by the spring, U, in connection with the cam or cams, t t, operating substantially as described and set forth.

4th, The deflecting tubes, i H, i H, for the purposes substantially described and set forth, and as combined with the portions, T T.

5th, The mode of shutting the valves, x x, fig. 1, by the backward motion of the cylinder, A B C D, as substantially described and set forth.

81,842.—CHURN.—J. W. Thompson, Bureau Junction, Ill.

I claim, 1st, The combination of the lever, E, segment, F, belt, H, vertical dasher staff, B, upright beaters, J J, and horizontal beaters, K H, when constructed and arranged to operate in the manner and for the purposes set forth.

2d, The ventilators, c c, substantially as and for the purposes set forth.

81,843.—TIGHTENING BAND FOR VESSELS.—John Tingley, Philadelphia, Pa., assignor to himself and Samuel L. Davis, Camden, N. J.

I claim, 1st, The plate, G, of a shape to fit the side of the vessel, having a projection, f, and secured to one end of a band, a screw rod at the other end of which passes through the projection, f, as and for the purpose described.

2d, The said band, with screw rod at one end and projection at the other, in combination with a handled nut, E, arranged to conform, or nearly conform, to the shape of the vessel to which the band is applied, as set forth.

3d, The slots, m, in the band, D, for the purpose specified.

81,844.—SMOKING PIPE.—Charles Tollner, Pulaski, N. Y.

I claim a smoking pipe or bowl, consisting of clay, which, in the process of manufacture, is successively baked, saturated with unctuous matter, and carbonized, substantially in the manner and for the purpose herein set forth.

81,845.—MACHINE FOR COVERING CORD.—John Turner, Norwich, Conn Antedated August 25, 1868.

I claim the covering bobbin, F, arranged and operating in combination with the twisting spindle, C, and yarn bobbin, D, substantially as shown and described

81,846.—SPRING SEAT FOR VEHICLES.—Oliver Vanorman, Ripon, Wis.

I claim the arrangement of the detachable seat, consisting of the elevated levers or bars, B B, with hooks and eyes, O, or equivalent devices, to the parallel bars, D D, substantially as described.

Also, the arrangement of the rubber springs, E E, fastened near the lower ends and on the under sides of the elevated seat bars, B B, which rest upon the parallel bars or levers, D D.

81,847.—WASH BOILER.—James Varley, Hudson City, N. J.

I claim, 1st, The central jointed tube, C, perforated upper chamber, D, and false bottom, B, in combination with each other and with a wash boiler, substantially as herein described.

2d, The telescopic or sliding joint, a, in combination with the central jointed tube, C, for adjustment of the upper chamber, D, or removal of the cover substantially as herein set forth.

3d, The combination of the lips, p p, and notches, e e, for locking in place the false bottom of the wash boiler, substantially as specified.

81,848.—SASH FASTENING.—Felix Wakler, Memphis, Tenn.

I claim the eccentric duplex balance wheels, a a, pivoted to the sash upon the same pivot, in combination with the curved keeper, e, constructed and operating as described for the purpose specified.

81,849.—EYEGLASS.—Edwin Want (assignor to himself and J. E. Spencer), New Haven, Conn.

I claim in combination with the bows of eye-glasses, constructed and arranged upon their spring, E, substantially in the manner described, the application of plates, H H, at the point of attachment of the bows to the spring E, in the manner and for the purpose specified.

81,850.—SLIDING SASH.—Gardner Warren, Boston, assignor to Wm. M. Byrnes, Charlestown, Mass.

I claim the metallic spring, D, with the flange, a, when constructed and applied substantially as described and for the purposes set forth.

81,851.—BLEACHING SOAP.—Alexander Watt, Wandsworth, England.

I claim a soap containing a soluble chloride or hypochloride, mixed and compounded with a previously made soap in a melted state, in the manner herein described.

81,852.—DIE FOR STAMPING WOODEN BOXES.—Wm. Weeks, Albany, N Y.

I claim the combination of sleeve, D, rods, F, punch, E, and collar, C, with a die, A, and plunger, G, constructed substantially as and for the purposes herein shown and described.

81,853.—HOT AIR ENGINE.—Francis H. Wenham, London, England, assignor to Andrew Sharks.

I claim, 1st, The cylinder, a, constructed as herein set forth, whereby a portion of air admitted into the cylinder is retained and compressed above the piston at each upward stroke of the same, substantially as set forth.

2d, The arrangement of the furnace, g, with the hopper, i, and grate, h, constructed with reference to the cylinder, a, substantially as herein set forth.

3d, The fire clay disk, o, constructed and fitted in the furnace substantially as and for the purposes set forth.

81,854.—PLANING MACHINE.—Alonzo Whitcomb, Worcester, Mass.

I claim the combination of the uprights, B, cross head, C, and the pivoted levers, D, arranged to operate substantially as described, for the purpose of readily adjusting the cross head of a planer and securing the same in position.

81,855.—BOX OPENER.—John Willard, Norwich, Conn.

I claim the combination of the chisel point, A, the tubular handle, B, and the weighted rod, C, constructed and arranged to operate substantially as set forth, as an article of manufacture.

81,856.—FRUIT JAR.—E R. Williams, Rochester, N. Y.

I claim the construction of the stopper, B, with a groove, a, extending part way around, and graduating into an incline, b, when employed in connection with the elastic band, i, in the manner and for the purpose specified.

81,857.—HAND PLOW.—W. B. Winton, Marion, Iowa.

I claim the curved serrated spring metal bar or plate, D, in combination with the pivoted plow beam, C, substantially as and for the purpose set forth.

81,858.—LUBRICATOR FOR AXLES.—John Worden Normal, Ill.

I claim the circumferential reservoir, C, connected with the perforated skein, B, and the axle, A, with its longitudinal groove, x, to operate substantially as specified.

81,859.—CUTTER HEAD.—Edward S. Wright (assignor to Samuel Leggett), New York city.

I claim the construction of the wedges, B B1 and B2, as described, that is, with the elongated slots, c, or recesses in the inner surfaces of the outer ones, and the projections b, upon the outer surfaces of the inner one, for the purpose of guiding said wedges in their movements, and also for preventing them from falling out of the cutter head when the center one is driven back for the purpose of releasing the knives.

81,860.—PULLEY.—John A. Burnap, Albany, N. Y.

I claim, 1st, The pulley and block, having the friction rollers constructed and arranged so as to be self-guiding, in the manner as described.

2d, The combination of the pulley, A, pulley block, B, and two sets of cylindrical rollers, c c c c and c' c' c' c', and flange, F, all constructed and used and shown described.

3d, The arrangement in the eye of the pulley, B, of two or more sets of cylindrical rollers, constructed and kept in position by means shown and described.

REISSUES.

79,942.—ANILINE DYE.—Dated July 14, 1868; reissue 3,103.

Benoit Bloch, Soultz, France.

I claim a dye composed of the ingredients herein named, and treated in the manner substantially as set forth.

70,523.—APPARATUS FOR RAISING AND SECURING THE LEGS OF HORSES TO SHOE THEM.—Dated Nov. 5, 1867; reissue 3,104.—J. P. Champion, Phelps, N. Y.

I claim the lever apparatus for raising and securing horses' legs, employed in connection with a suitable frame, arranged and applied substantially as herein shown and described.

42,199.—CARRIAGE CIRCLE COUPLING.—Dated April 5, 1864; reissue 3,105.—Geo. G. Larkin, West Amesbury, Mass.

I claim, 1st, The lower circle, J J K, formed with depressed rear portion, in combination with an upper circle, L, constructed and applied substantially as herein set forth.

2d, In combination with the lower circle, J J K, and upper circle, L, thus constructed and combined, the stop, M, for the purpose specified.

10,742.—ENEMA SYRINGE.—Dated April 4, 1854; extended seven years; reissue 3,106.—Morris Mattson, New York city.

I claim, 1st, the combination of the thumb or finger rest, d, with the barrel and piston, for the purpose set forth.

2d, The combination of the elastic or floating disk or valve, h', with its seat and chamber, arranged and operating substantially as described.

3d, Placing the ejection or outlet valve of a syringe at or near the extremity of the discharge or injecting tube most distant from the pump barrel, or its equivalent, for the purposes set forth.

78,113.—FURNACE FOR ROASTING ORES.—Dated May 19, 1868; reissue 3,107.—Charles Metlinger, Cornwall, Pa.

I claim, 1st, In combination with a desulphurizing furnace or oven for preparing iron ore for smelting, the sliding door or damper, B, arranged and operated substantially as described.

2d, In combination with a desulphurizing furnace, for the purposes mentioned, the grated or perforated arch, F, substantially as described.

3d, The combination of the arch, F, the chambers, E and E, the apertures, J and L, and the damper, B, substantially as and for the purposes described.

4th, A blast furnace, so constructed that the surplus heat or gas escaping from the same is utilized, thereby desulphurizing, preparing, or roasting the ore, preparatory to smelting, substantially as herein set forth.

36,987.—STEAM ENGINE PACKING.—Dated November 25, 1862; reissue 3,108.—William Hartley Miller, Philadelphia, Pa., assignee of James L. Bates, Providence, R. I.

I claim, 1st, The use of a braided or woven fibrous covering, in combination with a filling for packing, for the purposes above described.

2d, The use of the fillet or strip of cork, A, or other filling, in combination with the covering, b, or its equivalent, substantially as shown and described.

3d, The construction of packing, substantially as herein set forth

4th, The construction of fibrous braid coverings for packing, substantially as shown.

64,817.—MACHINE FOR GRINDING THE CUTTERS OF MOWING MACHINES.—Dated May 14, 1867; reissue 3,109.—Henry Whitall, Woodbury, N. J.

I claim, 1st, A rotary grinding wheel, for grinding the inclined beveled edges of the cutters of harvesters and mowing machines, on their bars, in combination with a frame, supporting the grinding wheel and its shaft, and mechanism for holding the face of the stone, and cutters, adjusted to the desired or predetermined bevel, in contact, the combination and arrangement being such that the grinding wheel and either of the opposite inclined beveled edges of the cutters may be brought, when desired, together, and retained in contact, substantially as described, and for the purpose specified.

2d, The combination, in a frame, of a rotary grinding wheel and an oscillating support, for changing the relative positions of the grinder and cutters, to operate on the opposite edges of the cutters, for the purpose set forth.

3d, The combination, in a frame, of a rotary and traversing grinding wheel, and an oscillating support, for changing the relative positions of the grinder and cutters, to operate on the opposite edges of the cutters, for the purpose set forth.

4th, A rotary and traversing grinding wheel, supported on a shaft, arranged angularly in the sliding frame, the position of the shaft in the frame being such that when the said sliding frame traverses parallel with the edge of the cutter, the mandrel will be parallel with the cutter bar, substantially as and for the purpose described.

5th, A rotary grinding wheel, supported on a traversing frame, and arranged to be adjusted in a horizontal plane, parallel with the faces of the cutter blades, substantially as and for the purpose described.

6th, The combination of the posts, B and B', provided with the sleeves, C and C', of the bent frame, D, jointed to the sleeves and the oscillating frame, substantially as and for the purpose described.

7th, The combination, with the bent frame, D, of the oscillating frame, E, pivoted thereto, and provided with means for adjustment, substantially as and for the purpose described.

8th, The combination, with the sliding and oscillating frame, of the driving shaft, grinder carrying shaft, grinding wheel, and their operating mechanism, substantially as and for the purpose described.

9th, The combination, with the machine, substantially as described, of the clamp, P, when arranged for joint action with the same, substantially as and for the purpose set forth.

10th, A grinding mechanism, substantially such as described, operating to grind the cutters while in the machine.

8,881.—PLANING MACHINE.—Dated April 13, 1852; extended seven years; reissue 2,676, dated July 9, 1867; reissue 3,110.—James A. Woodbury, Boston, assignee of J el Whitney, Winchester, Mass.

I claim, 1st, The method of connecting the movable feed roll to the stationary roll, when moving towards and from the same, in a constant plane, perpendicular to the board, by a duplicate system of similar gears at either end of the same, substantially as described.

2d, The arrangement of mechanism by which the upper feed roll is allowed to yield to any inequalities in the board, and at the same time is drawn down upon its surface to which it has yielded in proportion to the resistance to its progress, substantially as described.

3d, In combination with a pair of feed rolls geared and driven from both of their ends, and the duplicate sets of intermediate gears working in and with them, the connecting of said intermediate or driving gears by substantial shafts extending clear across from one set to the opposite set, by which the lifting and driving are done at both ends of the rolls, and the twisting, bending or straining of journals or bearing avoided, substantially as described.

4th, The arrangement of the gears, D, loosely, so as to turn upon their movable but non-rotating connecting shaft, I, so that said shaft and gears may be free to accommodate themselves to the yielding feed roll, and avoid the necessity of movable journal boxes or bearings, substantially as represented, and for the purpose described.

33,038.—FRUIT JAR.—Dated December 17, 1861; reissue 3,111.—S. B. Rowley, Philadelphia, Pa., assignee of N. S. Gilbert.

I claim, 1st, A jar, having a shoulder on the neck, below the mouth (a flanged cap, which overlaps the neck, and a packing, which is compressed between the shoulder and the cap, substantially as set forth.

2d, The combination of a cover, A, adapted to the mouth of a jar, and to a packing on an exterior shoulder below the mouth, with a bail, D, or its equivalent, arranged to have a screw-like action on the jar below the said shoulder, substantially as described.

DESIGNS.

3,186.—CORSET.—Luman L. Chapman, Philadelphia, Pa.

3,187.—CARPET PATTERN.—Hugh Christie, Morrisania, N. Y.

3,188.—COOK STOVE PLATES.—John D. Flansburgh, Philadelphia, assignor to Thomas, Roberts, Stevenson & Co., Bucks County, Pa., antedated August 11, 1868.

3,189.—BASE OF A MORTISING MACHINE.—D. L. Gibbs, Worcester, Mass.

3,190.—PLATES FOR PORTABLE RANGES.—John Martino, Jacob Beesley, and John Currie (assignors to Abbott & Noble), Philadelphia, Pa.

3,191.—PATTERN FOR KNITTED FABRIC.—Joseph D. McKee, Philadelphia, Pa.

3,192.—PATTERN FOR KNITTED FABRIC.—Joseph D. McKee, Philadelphia, Pa.

3,193.—COOK STOVE PLATES.—John R. Rose, and Edward L. Calely, Philadelphia, assignors to Thomas, Roberts, Stevenson & Co., Bucks County, Pa., antedated August 11, 1868.

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

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2,312.—MODE OF, AND APPARATUS FOR TREATING FLAX.—L. McDonald Hills, New Haven, Conn. July 23, 1868.

2,324.—ROLLERS FOR SLIDING DOORS.—R. G. Hatfield, New York city. July 24, 1868.

2,342.—PORTABLE RAILWAY.—Jas. K. Glenn, New York city. July 25, 1868.

2,345.—BELL PULL FOR DOOR BELLS.—Sterling Bonsall and Louis Hillebrand, Philadelphia, Pa. July 25, 1868.

2,346.—STEAM BOILERS, AND MEANS FOR MAINTAINING THE PROPER WATER LEVEL IN THE SAME.—Robert Wilde, Philadelphia, Pa. July 25, 1868.

2,355.—PROPELLER FOR STEAM VESSELS.—Robert Hunter, New York city. July 27, 1868.

2,367.—PREPARATION OF EGGS.—Chas. A. La Mont, New York city. July 28, 1868.

2,376.—SUBSTITUTE FOR LINSEED OIL.—Robert E. Ferguson and Benbow B. Ferguson, Chicago, Ill. July 29, 1868.

2,377.—BREECH-LOADING AND OTHER FIRE-ARMS.—Samuel Remington, Ilion, N. Y. July 9, 1868.

2,378.—SEWING MACHINES, AND MEANS FOR HEATING THE THREAD.—Daniel Mills, New York city. July 29, 1868.

2,392.—PILE OR PORTABLE BATTERY FOR GENERATING ELECTRICITY.—Alfred C. Garratt, Boston, Mass. July 30, 1868.

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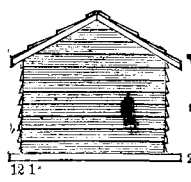

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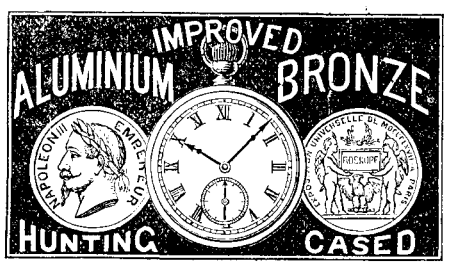

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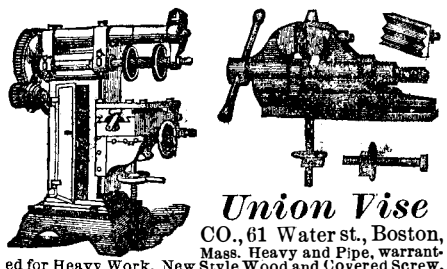

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U. S. PATENT OFFICE,
WASHINGTON, D. C., August 27, 1868.

Emeline M. Woodruff (late Emeline M. Stedman), of Elizabeth, N. J., executrix of the estate of Geo. W. Stedman, deceased, having petitioned for an extension of the patent granted to said Geo. W. Stedman the 12th day of December, 1854, and reissued the 26th day of April, 1859, for an improvement in "Sewing Machines," it is ordered that said petition be heard at the office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 2, 1868.

Birdsill Holly, of Lockport, N. Y., having petitioned for an extension of the patent granted to him on the 6th day of February, 1855, for an improvement in "Eliptical Rotary Pumps," it is ordered that said petition be heard at this office on the 11th day of January next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug. 28, 1868.

Aaron H. Allen, of Boston Mass., having petitioned for an extension of the patent granted to him on the 5th day of December, 18—, for an improvement in "Seats for Public Buildings," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., August 31, 1868.

Jeremiah Stever, Bristol Conn., having petitioned for an extension of the patent granted him on the 12th day of December, 1854, for an improvement in "Machines for Scraping Metals," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug. 28, 1868.

John Pepper, of Gilford, N. H., having petitioned for an extension of the patent granted to him on the 5th day of December, 1854, and reissued on the 27th day of October, 1863, for an improvement in "Circular Knitting Machines," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
Washington, D. C., Sept. 4th, 1868.

Samuel N. Miller, of Dedham, Mass., having petitioned for the extension of the patent granted him on the 29th day of June, 1852, for an improvement in "Combined Anchor," this application having been authorized by Act of Congress, approved July 20, 1868, it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE.
Washington, D. C., Sept. 1st, 1868.

Cyrenus Wheeler, Jr., of Auburn, N. Y., having petitioned for the extension of a patent granted him on the 5th day of December, 1854; reissued Jan. 3, 1860, in seven divisions, numbered 875, 876, 877, 878, 879, 880 881, and reissue numbered 876, again reissued May 14, 1867, and numbered 2,610, for an improvement in "Grain and Grass Harvesters," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE.
Washington, D. C., Sept. 1st, 1868.

Cyrenus Wheeler, Jr., of Auburn, N. Y., having petitioned for the extension of a patent granted him on the 6th day of Feb. 1855; re issued June 5, 1860, and numbered 971, and again reissued May 28, 1867, and numbered 2,632, for an improvement in "Grain and Grass Harvesters," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug 24, 1868.

James H. Whitney, of Brooklyn, N. Y., administrator of the estate of Theodore E. Weed, deceased, having petitioned for an extension of the patent granted the said Theodore E. Weed on the 28th day of November, 1854, for an improvement in "Sewing Machines," it is ordered that the said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug. 21, 1868.

Whitten E. Kidd, of New York city, having petitioned for an extension of the patent granted him on the 28th day of November, 1854, and reissued the 13th day of January, 1857 for an improvement in "Molds for Pressing Bonnet Fronts," it is ordered that the said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE
WASHINGTON, D. C., Aug. 3, 1868.

Daniel G. Ambler and Halsted H. Hoeg, of Jacksonville, Fla., administrators of the estate of Daniel C. Ambler, deceased, having petitioned for an extension of the patent granted to the said Daniel C. Ambler on the 7th day of November, 1854, for an improvement in "Sewing Machines," it is ordered that said petition be heard at this office on the 2d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug. 21, 1868.

T. J. W. Robertson, of Washington, D. C., having petitioned for an extension of the patent granted him on the 28th day of November, 1854, for an improvement in "Sewing Machines," it is ordered that the said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
11 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C, Aug. 15, 1868.

Charles Parham, of Philadelphia, Pa., having petitioned for an extension of the patent granted him on the 21st day of November, 1854, and reissued on the 3d day of November, 1863, for an improvement in "Sewing Machines," it is ordered that said petition be heard at this office on the 2d day of November, next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug. 20, 1868.

George W. Lee, of Winchester, Ohio, having petitioned for an extension of the patent granted him on the 21st day of November, 1854, for an improvement in "Seed Planters," it is ordered that said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug. 12, 1868.

Eliza Mascher, of Philadelphia, Pa., administratrix of the estate of John F. Mascher, deceased, having petitioned for an extension of the patent granted the said John F. Mascher the 8th day of March, 1853, for an improvement in "Daguerreotype Cases" (this application having been authorized by act of Congress, approved July 27, 1868), it is ordered that the said petition be heard at this office on the 2d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug 12, 1868.

John Cram, of Boston, Mass., having petitioned for an extension of the patent granted him on the 28th day of November 1854, for an improvement in "Towel Stand or Clothes Horse" It is ordered that said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
10 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug. 13, 1868.

Jacob Swartz, of Philadelphia, Pa., having petitioned for an extension of the patent granted him on the 14th day of November, 1854, reissued on the 5th day of June, 1860, and again reissued in three divisions, numbered 1,313, 1,314, and 1,315, on the 3d day of June, 1862, for an improvement in "Harvesters," it is ordered that this petition be heard at this office on the 2d day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed at this office twenty days before the day of hearing.
10 3 ELISHA FOOTE, Commissioner of Patents.

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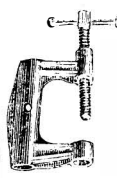

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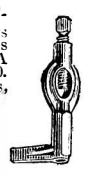

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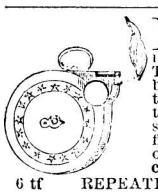

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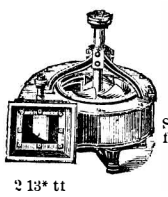

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